TECHNOLOGY DEPT.

JUNE 1952

The Paper Industry

PUBLIC LIBRARY
JUN 16 1952
DETROIT

WILLIAM L. BARRELL CO.
BOSTON, MASS.

SIAMESE

for faster

uniform drying

WILLIAM L. BARRELL COMPANY

52 CHAUNCY ST., • BOSTON, MASS.

• *Siamese and Tour Boss Dryer Felts* •

Handles Them All!

High Speeds
High Pressures
High Temperatures
Heavy Duty

This Type "FSG" ROTARY UNION was designed especially to meet the rugged service required on revolving paper mill equipment such as dryers, calenders, and digesters. Leading mills are now using this sealing unit on *all* of their heavy duty equipment and many report continuous service of three years or more without requiring even the slightest tightening or adjusting or causing one minute's down-time.

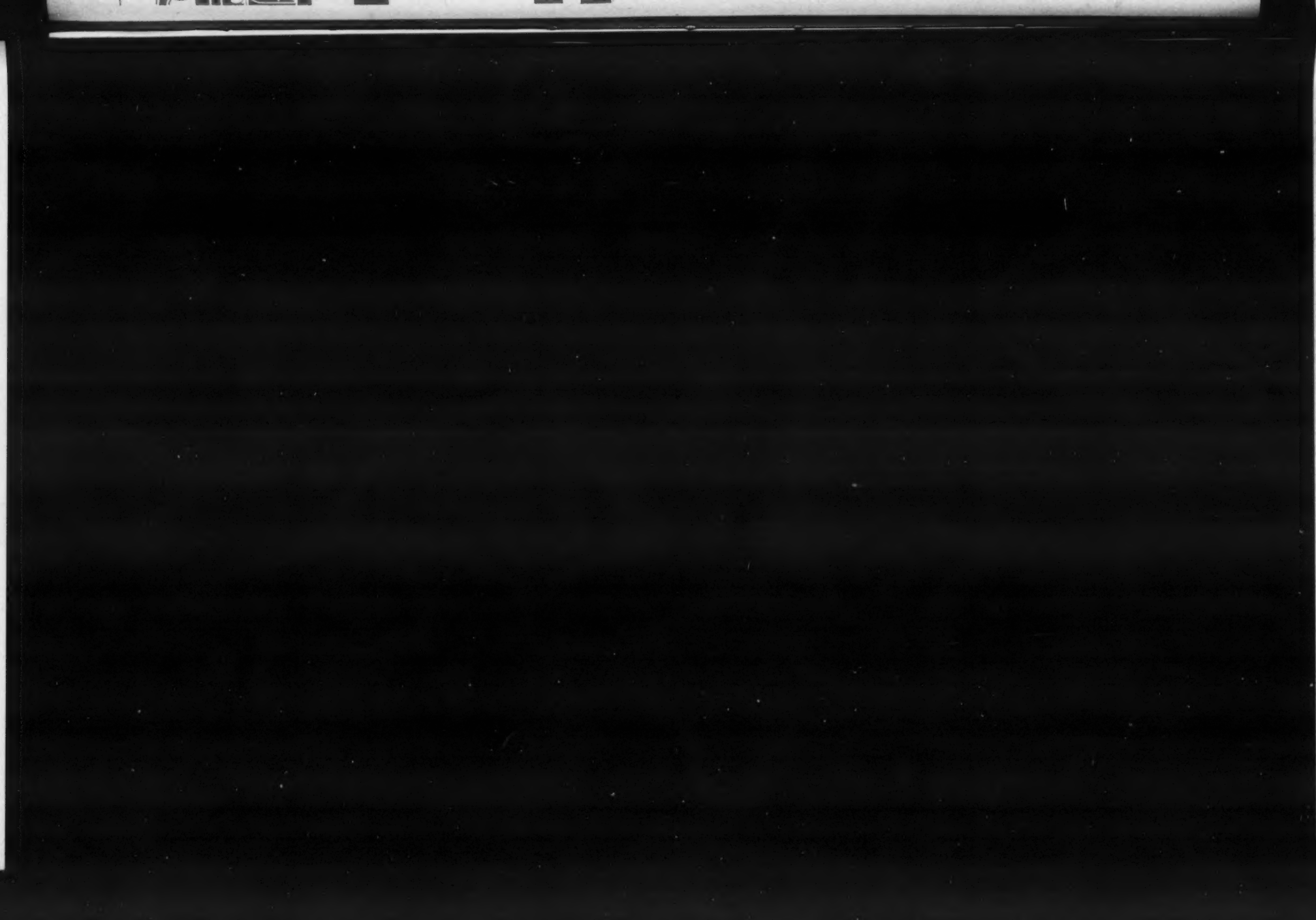
This Type "FSG" ROTARY UNION is one of 40 models and sizes available for any sealing job where revolving shafts or drums require heating or cooling. Our own sales engineers are available to discuss your problems. Call our nearest office, see our advertisement in PAPER AND PULP MILL CATALOGUE, or write Dept. 6P for our latest catalog.

This type "FSG" ROTARY UNION has a two point syphon support which assures better alignment of the syphon pipe, prevents its wearing through and falling off, and eliminates excessive strain on syphon pipe threads.

"WHERE *Good Connections* COUNT"®

PERFECTING SERVICE COMPANY

332 Atando Avenue (Home Office and Factory) Charlotte, N. C.



Better corrugating

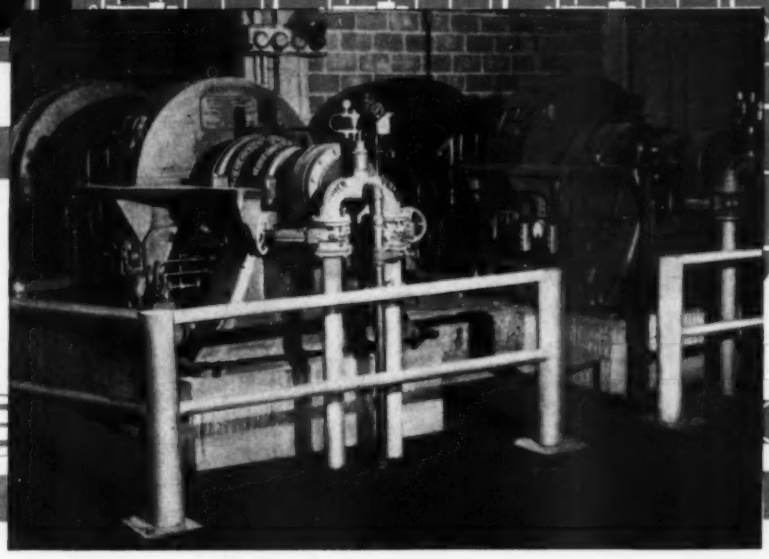


Photo courtesy of Gibraltar Corrugated Paper Co., Inc.

from waste stock

Like the many other Sutherlands in the mixed-paper field, these two at Gibraltar Corrugated Paper Co., Inc., are given credit for helping to make a better quality board. Improved flat crush, plus their power and maintenance savings, explains why leading papermakers are putting more and more stock into Sutherlands.

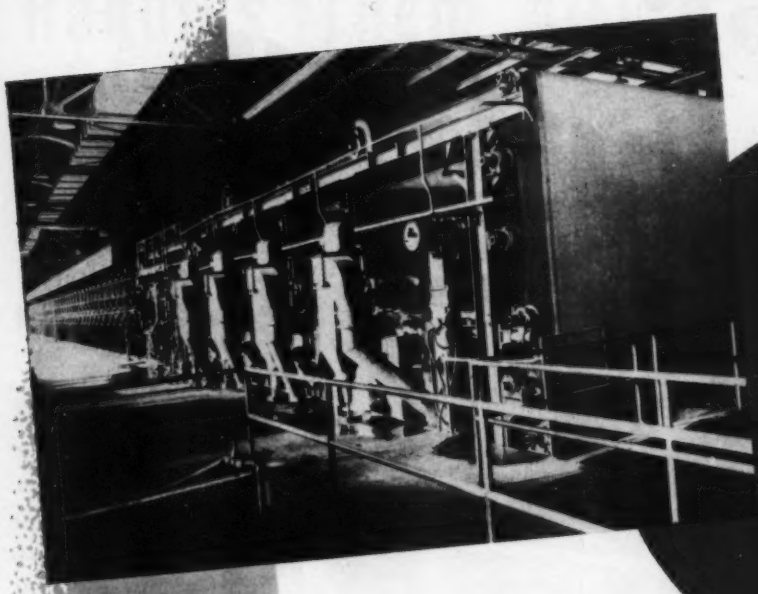
SUTHERLAND

continuous beating systems

Designed, Engineered, Serviced

***by* SUTHERLAND REFINER CORPORATION**

TRENTON 8, N. J.



Alton's No. 3 machine, world's record strawboard producer. Photo courtesy of Alton Box Board Company, Alton, Illinois.

Nalco

3-WAY SERVICE

at Alton Box Board Company

HERE are the three water treatment services performed by Nalco at Alton Box Board Company, Alton, Illinois. In addition, experimental work on process waters using Nalco anti-foam chemicals is now being done at Alton:

1 SLIME CONTROL chemicals, fitted to Alton Box Board requirements, help maintain high quality . . . prevent slime spots and breaks due to slime.

2 CLARIFICATION of mill water with Nalco #680 Sodium Aluminate . . . A versatile chemical also used widely for size control and maximum alum availability.

3 BOILER WATER TREATMENT with specially-processed organic chemicals for use in high-capacity, high-pressure boilers.

Use of Nalco Chemicals and Services at Alton Box Board Company shows clearly the wide extent to which good water treatment, properly applied, can be utilized to make over-all mill operation cleaner, more efficient and more economical.

The Nalco System can be applied selectively, or for complete water treatment protection in *your* mill. Write today for full details on your specific water treatment problems.

NATIONAL ALUMINATE CORPORATION
6232 West 66th Place
Chicago 38, Illinois
Canadian inquiries should be addressed to Alchem Limited, Burlington, Ontario

THE Nalco SYSTEM • Serving the Paper Industry through Practical Applied Science

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 34 • NUMBER 3 • JUNE, 1952

Features . . .

Canadian pulp and paper industry investments in expansion continue 319
Forestry activities show increase 321
Tight newsprint supply situation is seen easing appreciably 325
Shortage of engineers cited at Institute Executives Conference 329
Paper industry in U. S. plans expanded production 332
Wisconsin maintains effort toward reducing sulphite pollution 338
Expanded use of corn products in paper making 350
by Floyd A. Lewis
Westvaco completes modernization project 356
An accelerated freeness test for slow stock 359
by Raymond E. Taylor and D. S. Davis
Papermaking economics: the new and the old 360
by Gordon B. Shattuck
Champion Paper uses the IBM calculator 364
Better paper through engineered lighting 366
by W. H. Kahler and W. P. Werner

News . . .

News of the Industry 319
Association News 370
Names in the News 378
Safety News 387
Necrology 388

Departments . . .

Editorial 307
Current Comment 309
Financial Reports 310
Paper Sketches 367
Coming Events 377
Foreign Abstracts 390
New Products 396
New Literature 402
Current Market Quotations 406
Index to Advertisers 403

The PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index.** An index to each volume is issued annually by the publisher as a part of the April number.

Copyright 1952, by Fritz Publications, Inc.

Published monthly by:
FRITZ PUBLICATIONS, INC.
Edward B. Fritz (1869-1939), Founder

Publication Staff:

President and General Manager
A. SCOTT DOWD

Vice President and Treasurer
A. C. L. FRITZ

Secretary
A. C. BRUCE

News Editor
D. W. ZEIGLER

Production Manager
EDGAR C. FARREN

Circulation Manager
STANLEY E. BOIE

Circulation Field Representative
C. J. ELWELL

Advertising Representatives:

BOSTON 16: **Meade & Company,** 471 Statler Building, Liberty 2-9677.

CHICAGO 5: **John D. Henderson,** 431 South Dearborn Street, Wabash 2-3543.

CLEVELAND: **L. M. Perkins,** 1199 Dorsh Road, South Euclid 21, Ohio, Evergreen 1-3232.

LOS ANGELES 14: **Murray Bothwell,** 412 West Sixth Street, Vandike 5875.

NEW YORK 20: **L. S. van Nydeck,** 9 Rockefeller Plaza, Circle 7-3085.

NEW YORK 25: **H. A. Johnston,** 945 West End Avenue, Academy 2-6984.

PORTLAND: **Murray Bothwell,** 412 West Sixth Street, Los Angeles 14, Calif., Vandike 5875.

SEATTLE 4: **Arthur G. Naitz,** 914 Second Avenue, Eliot 1769.

THE PAPER INDUSTRY—founded in 1919—known as "The Paper Industry and Paper World" from June, 1939, through December, 1949, assumed its original title with the January, 1950, issue.

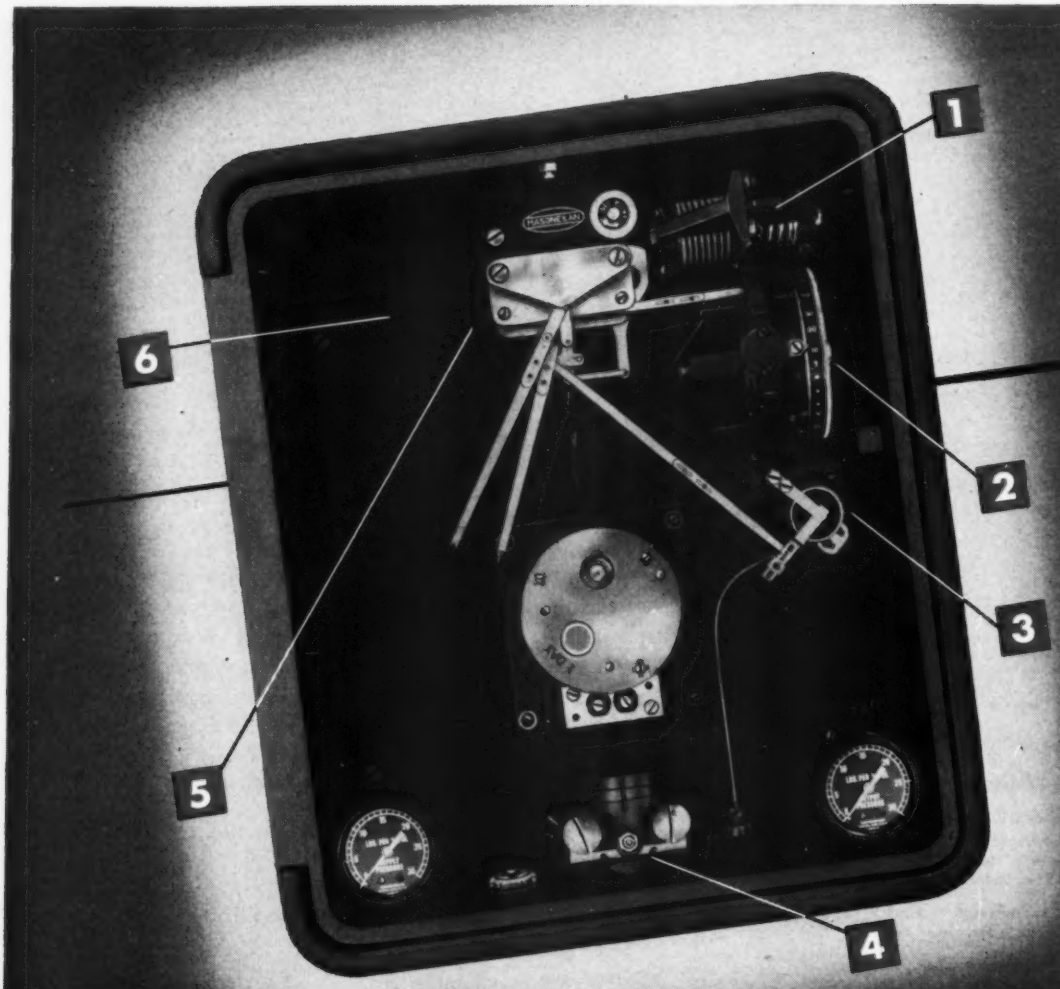
Published at 404 North Wesley Avenue, Mount Morris, Illinois.

Address all correspondence intended for publication to Editorial and Executive Office, 431 South Dearborn Street, Chicago 5, Illinois.

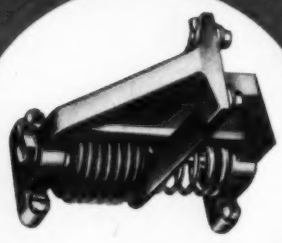
Member: Audit Bureau of Circulations, The Associated Business Publications.

Entered as second class matter December 13, 1948, at the post office at Mount Morris, Illinois, under the Act of March 3, 1879.

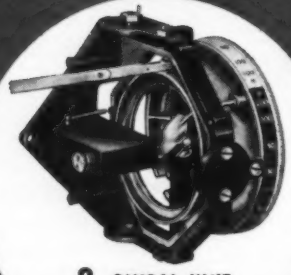
Subscription rates: United States, U. S. Possessions, and Canada, $3.00 for one year, $5.00 for two years, $6.00 for three years. All other countries, $8.00 for one year, $18.00 for three years, payable in advance in U. S. Funds.



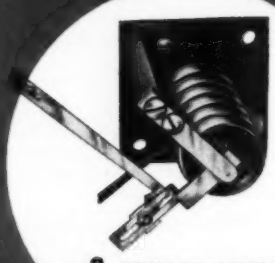
MASONEILAN 60000 SERIES PNEUMATIC CONTROLLER



1. PROPORTIONAL UNIT
interchangeable with proportional-reset unit.



2. GIMBAL UNIT
combines primary and feed-back motions — basic in all controllers.



3. PRIMARY ELEMENT
helical or spiral bourdon, or bellows as required.

A HIGH Quality PRODUCT

Instrument Man's Instrument

MASONEILAN

The New Masoneilan "6-in-1" Controller
IS SIMPLE AS A B C

One Setting of basic "6-in-1" controller

selects on-off, proportional, or differential-gap control; direct or reverse action; proportional band or differential-gap setting.

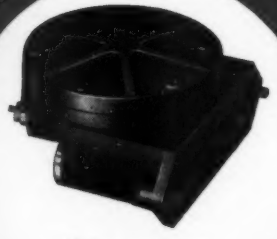
Easy to Set, Adjust, Test and Service —

all settings made without removing chart; all subassemblies complete and directly accessible; all air passages manifolded; four-position transfer switch in manual control subpanel.

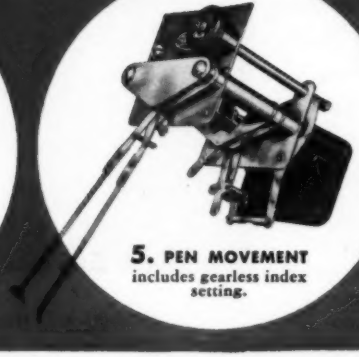
Easy to detach and interchange subassemblies

from backplate-manifold to vary desired control function; for cleaning or servicing.

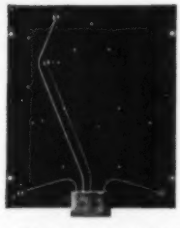
Available Now for Prompt Delivery



4. RELAY PILOT
with cleanable orifice and integral filters.



5. PEN MOVEMENT
includes gearless index setting.



6. BACKPLATE-MANIFOLD
supports subassemblies; conceals, supports, tubing; eliminates fittings.
(Rear View)

MASON-NEILAN REGULATOR CO.
1187 ADAMS STREET, BOSTON 24, MASS., U. S. A.

Sales Offices or Distributors in the Following Cities:
New York • Syracuse • Chicago • St. Louis • Tulsa • Philadelphia • Houston • Pittsburgh • Atlanta • Cleveland Cincinnati • Detroit • San Francisco • Salt Lake City • El Paso • Boise • Albuquerque • Charlotte • Los Angeles Denver • Appleton • Corpus Christi • New Orleans • Mason-Neilan Regulator Co., Ltd., Montreal and Toronto

Getting Down to Brass Tacks

. . . about Fire Protection and HORTON Elevated Water Tanks

A Horton elevated water tank and an automatic sprinkler system will assure a pulp and paper mill of 24 hour a day fire protection. Water *instantly* and *automatically* flows from the tank as soon as a sprinkler head opens. That's the result of gravity pressure. Flames can be quickly quenched to reduce damage.

The installation of a Horton elevated water tank for fire protection often reduces insurance costs. Savings in premiums can usually pay for the tank in a few years.

Horton elevated tanks are built to meet the requirements of the National Board of Fire Underwriters, the Inspection Department, Associated Factory Mutual Fire Insurance Companies, or the Factory Insurance Association.

HORTON ellipsoidal-bottom elevated water tanks are built in standard capacities from 15,000 to 500,000 gallons and radial-cone tanks in sizes from 500,000 to 3,000,000 gallons. Horton Waterspheres are built in standard capacities from 25,000 to 250,000 gallons.

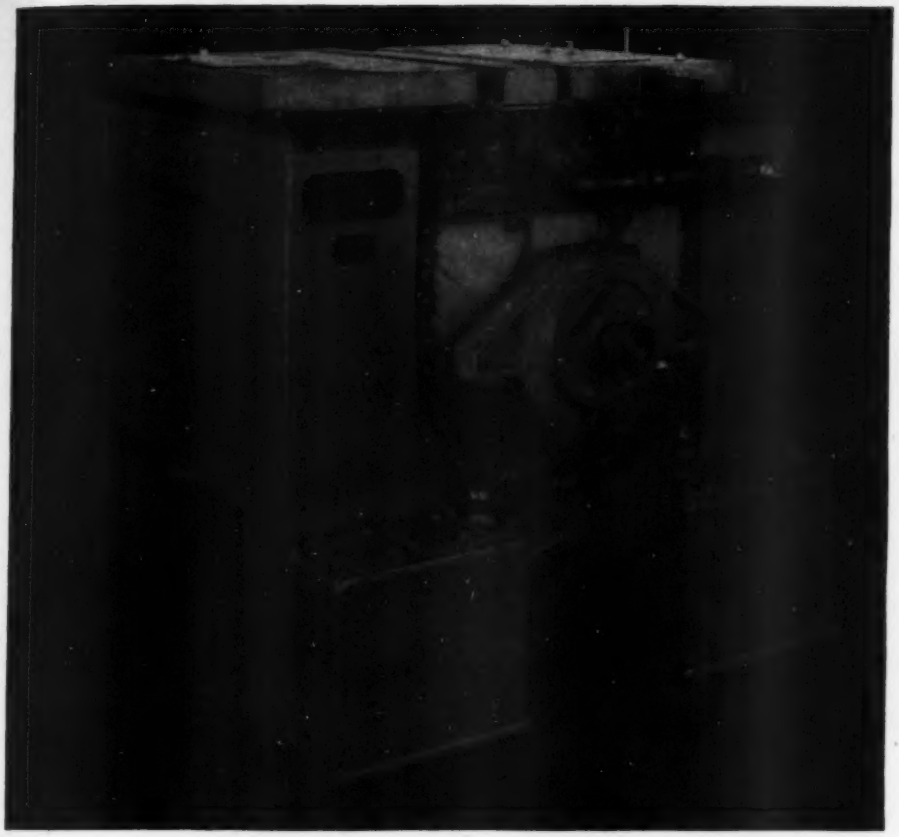
Write our nearest office for further information. When requesting estimating figures or quotations, please give location of tank, governing insurance specifications, capacity, and height to bottom.

100,000-gal. Horton ellipsoidal-bottom elevated tank, 100 ft. to bottom, providing gravity water pressure for sprinkler system at a paper mill in Pennsylvania.

CHICAGO BRIDGE & IRON COMPANY

Atlanta, 3.....2143 Healey Building
Birmingham, 1.....1511 North 50th Street
Boston, 10.....1026—201 Devonshire Street
Chicago, 4.....2445 McCormick Building
Cleveland, 15.....2267 Guildhall Building
Detroit, 26.....1566 Lafayette Building
Havana.....402 Abreu Building
Houston, 2.....2143 C & I Life Building
Los Angeles, 17.....1559 General Petroleum Building
New York, 6.....3350—165 Broadway Building
Philadelphia, 3.....1653—1700 Walnut Street Building
San Francisco, 4.....1547—200 Bush Street
Seattle, 1.....1327 Henry Building
Tulsa, 3.....1651 Hunt Building
Washington 6, D.C.....1138 Cafritz Building

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA. In Canada: HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT.



THE LINDBLAD PULP SCREEN
SAVES VALUABLE FLOOR SPACE IN QUALITY SCREENING OPERATIONS

The Lindblad Screen is designed to enable your mill to have high-quality screened pulp at lower operating cost.

In order to achieve high-quality screening operations, the Lindblad incorporates such characteristics as--

A positive oil-lubricating system
Twelve sectionalized cut plates
Bottom feed inlet box and tailings outlet for sub-floor piping
Self-cleaning ability
Low power and water consumption
High capacity
Space-saving ability
No concrete damping block required

These distinguishing features earn for the Lindblad Pulp Screen a definite place in your mill.

IMPCO

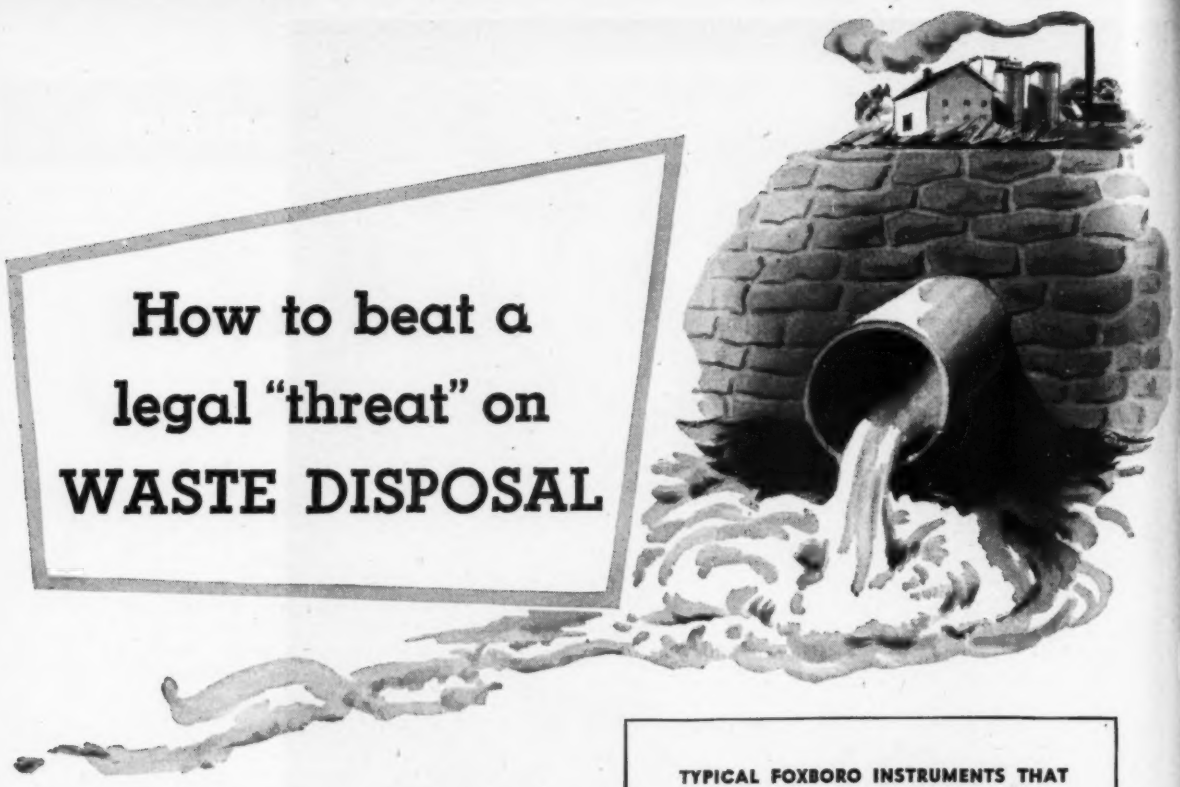
J–19

IMPROVED PAPER MACHINERY CORPORATION

NASHUA, NEW HAMPSHIRE

Sherbrooke Machineries Limited manufacture similar equipment in Canada

How to beat a legal "threat" on WASTE DISPOSAL



. . . and cut fibre and chemical losses!

WITH STATE AFTER STATE now imposing legal restrictions on industrial waste disposal, you may be faced with this problem quite suddenly. Only by starting to gather complete data now can you be prepared for necessary action when that time comes. And the same data will reveal the extent of your fibre and chemical losses in plant waste. (The Foxboro waste-sampling system gives a continuous sample always in proportion to effluent rate—thereby assuring an accurate analysis.)

Foxboro has prepared a concise, informative bulletin on how to conduct a waste disposal survey. Based on specialized knowledge and long experience, this bulletin outlines the simple steps you can take to avoid hasty, last-minute plans. It shows how a careful, unhurried survey now can easily provide the facts on day-to-day quantities, concentrations, and constituents, so essential to efficient planning.

Send for a copy of "Waste Disposal Surveys". Write **The Foxboro Company, 826 Neponset Ave., Foxboro, Mass., U. S. A.**

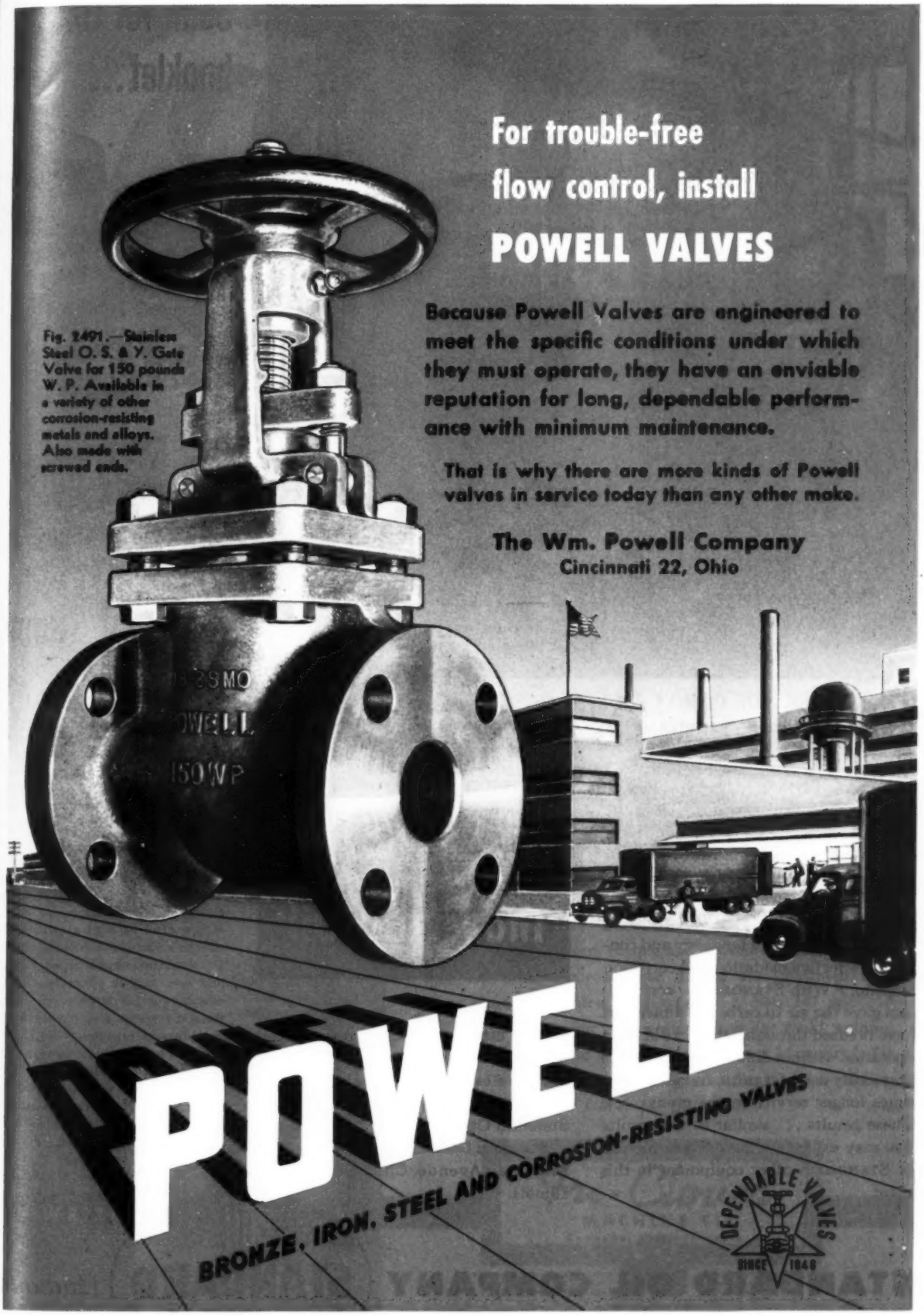
TYPICAL FOXBORO INSTRUMENTS THAT LEAD TO BETTER WASTE DISPOSAL

The Model 40 . . . "The finest modern controlier" . . . is the foundation of many outstanding Foxboro Waste Disposal Systems. It is used for the control of flow, pH, conductivity, temperature and other variables. Thousands are in use daily.

Foxboro Float and Cable Type Instruments are specifically designed for use on weirs and Parshall flumes. They read directly in *flow*.

FOXBORO
REG. U. S. PAT. OFF.

RECORDING · CONTROLLING · INDICATING
INSTRUMENTS


For trouble-free
flow control, install
POWELL VALVES
Because Powell Valves are engineered to meet the specific conditions under which they must operate, they have an enviable reputation for long, dependable performance with minimum maintenance.
That is why there are more kinds of Powell valves in service today than any other make.
The Wm. Powell Company
Cincinnati 22, Ohio
Fig. 2491.—Stainless Steel O. S. & Y. Gate Valve for 150 pounds W. P. Available in a variety of other corrosion-resisting metals and alloys. Also made with screwed ends.
POWELL
BRONZE, IRON, STEEL AND CORROSION-RESISTING VALVES
DEPENDABLE VALVES
SINCE 1848

Compressors give carbon the air

• When carbon formed on the valves of these air compressors and the oil in the crankcases had to be changed frequently, operators of this Midwest plant called in a Standard Oil lubrication specialist. He recommended STANOIL Industrial Oil, a multi-purpose oil having a low carbon-forming tendency and containing effective oxidation and corrosion inhibitors. With STANOIL, the compressors gave the air to carbon troubles and have breezed through four years of hard operation without difficulty. Over the oil previously used, STANOIL has given four times longer service in the crankcases. These results . . . similar to the results you may expect . . . have led to the use of STANOIL in other equipment in this plant.

STANOIL
TRADE MARK
Industrial Oil

Find how this multi-purpose oil can benefit you by discussing it with a Standard lubrication specialist. You can contact him by phoning your local Standard Oil office.

Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

Send for this booklet...

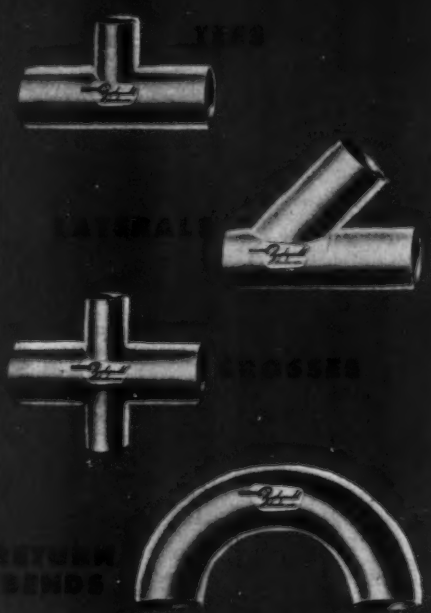
See what Stanoil offers you...

You'll find the means to significant savings in this booklet. It describes the important qualities of STANOIL Industrial Oil and the resultant benefits which have made this multi-purpose oil the choice of midwest manufacturers for a host of important lubricating jobs. Discover how STANOIL will give you superior protection through its unique combination of six outstanding characteristics, including high stability and effective rust prevention. Find how STANOIL can simplify stock, storage, and inventory in your plant by replacing special-purpose oils in hydraulic systems, speed reducers, air compressors, machine tools, electric motors, auxiliary turbines, and a wide variety of circulating, bath, and bearing systems. Ask the Standard Oil lubrication specialist from your nearby Standard Oil office for this booklet, or write: Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago.

STANDARD OIL COMPANY **STANDARD** *(Indiana)*

Zephyrweld®

WELDING FITTINGS for the PULP and PAPER INDUSTRY . . .



QUALITY *Stainless Steel Butt Welding Fittings in Schedule 5 and 10 and Tube O. D. Sizes from ½" through 36" for* FULL CORROSION RESISTANCE

● TRI-CLOVER now offers the most complete line of *Zephyrweld* stainless steel welding fittings in sizes from ½" through 36" for use with stainless steel light gauge pipe and tubing.

These quality fittings are annealed, pickled, and passivated, and offer full corrosion resistance for meeting scores of pulp and paper industry requirements . . . such as conveying lines for black liquor, green liquor, white liquor, white water, kraft pulp, etc.

Employing modern, unique and proved methods throughout, *Zephyrweld* porosity-free fittings are fabricated from three standard stainless steel types . . . 304, 347 and 316.

Zephyrweld fitting ends are cut flush for rapid welding. Because of their light gauge, no chamfering is required. Fittings can be flame cut for disassembly, used again by re-welding.

See your nearest jobber for full details. PI-152

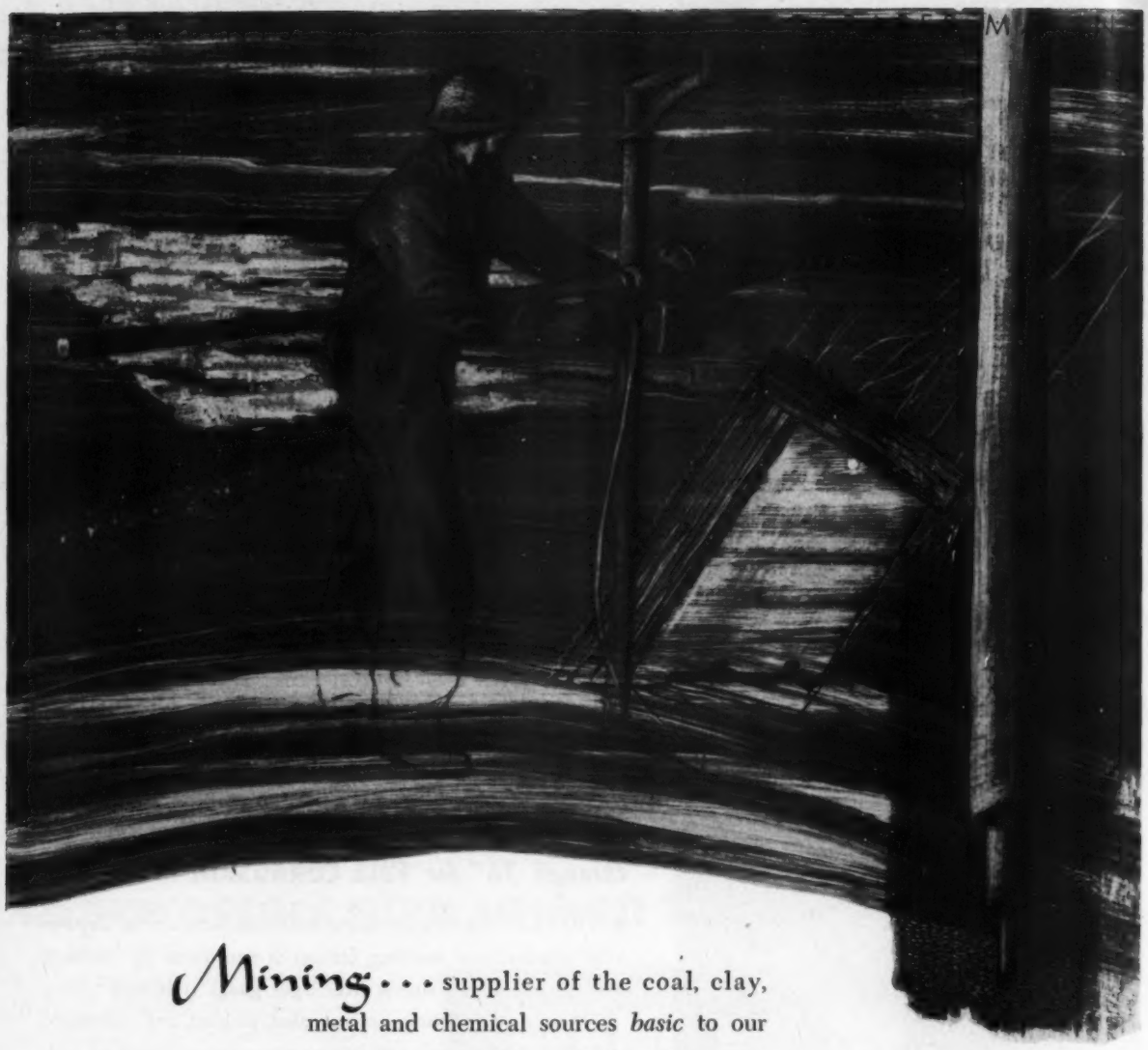
WRITE FOR CATALOGS

Tri-Clover®
MACHINE CO.
Kenosha, Wisconsin

TRIALLOY AND STAINLESS STEEL SANITARY FITTINGS, VALVES, PUMPS, TUBING, SPECIALTIES

FABRICATED STAINLESS STEEL INDUSTRIAL FITTINGS AND INDUSTRIAL PUMPS

THE Complete LINE



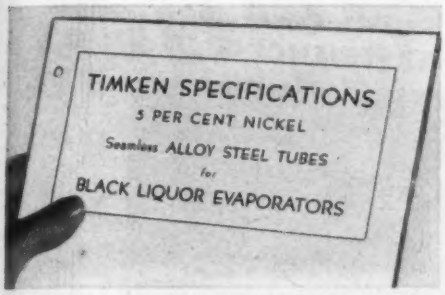
Mining . . . supplier of the coal, clay, metal and chemical sources *basic* to our national economy . . . *vital* to the paper industry.

Fourdrinier Wires . . . vital, also, to the paper industry, have received at Appleton Wire Works, Inc., the intense focus of 56 years of experienced research . . . resulting in the *earned* acknowledgement that *"Appleton Wires are Good Wires!"*

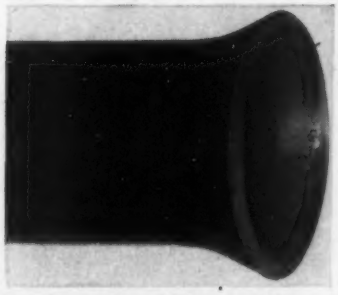
APPLETON WIRE WORKS, INCORPORATED • APPLETON, WISCONSIN

Don't be in the dark about black liquor evaporator tubes!

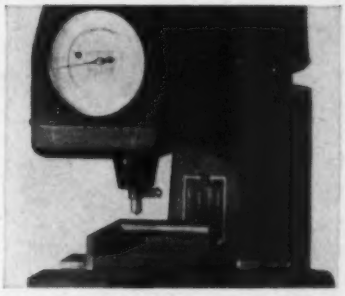
TIMKEN® shows you what you get



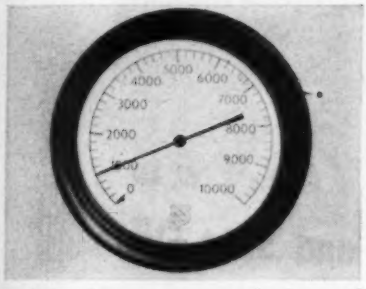
Specifications for Timken® 3½% and 5% nickel evaporator tubes show you everything you want to know when you buy evaporator tubes. Here are typical specifications:



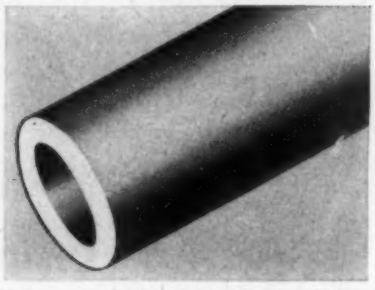
Seamless tubing I.D. must withstand being expanded 20% over a tapered mandrel without cracking or showing flaws.



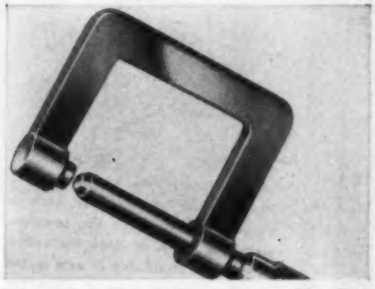
In Rockwell hardness tests, specimen cut from the tube must have a Rockwell hardness number not exceeding B89.



Each Timken evaporator tube is tested under hydrostatic pressure of 1000 p.s.i. before shipment to the customer.



Tubes must be free from physical defects and free from scale. Tube finish must be workmanlike.



Dimensional variations in outside diameter, wall thickness and cut length, shall not exceed close allowable tolerances.

. . . and guarantees you'll get it!

NO need to be in the dark when you buy black liquor evaporator tubes. Specifications published by the Timken Company for 3½% and 5% nickel tubes cover every essential point—chemical composition, physical properties, inspection methods and definite tests—show you exactly what you get.

And the Timken Company guarantees that every lot of tubes will meet these high specifications. Quality is controlled at every step. Tubes are tested and inspected before shipment. As a result, you reduce tube replacement costs, save tube sheet wear, cut down time. Write on your company letterhead for 3½% and 5% nickel tube specifications. The Timken Roller Bearing Company, Steel and Tube Div., Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

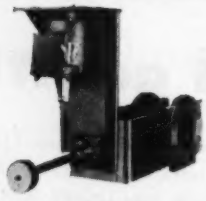
SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

R-S valvEvents

• EXCERPTS FROM THE R-S BOOK OF EXPERIENCE •

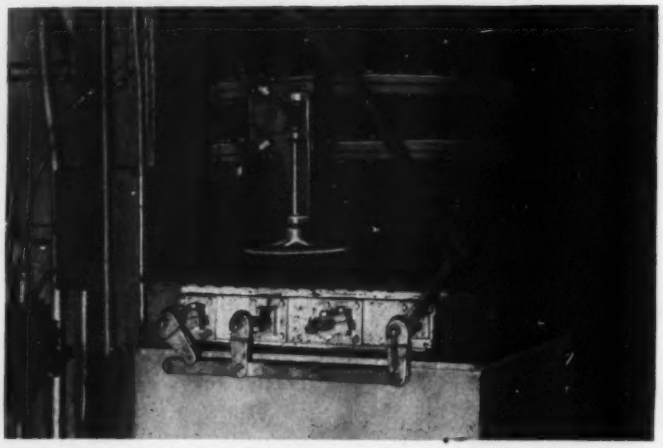
WATER SERVICE—No. 825—36-inch 125-pound cast iron valve equipped with 18—8 shafts, bronze bushings and rubber seat for 85-pound drip tight shut-off.

EMERGENCY OIL SERVICE—No. 628—solenoid trip valve. Should the solenoid function, the latch is tripped which causes the counter-weight to open or close the valve by gravity. Available in any metal or alloy and in various sizes for emergency shut-off or vent for air, gas, steam, oil, and water.



700° F. EXHAUST GAS SERVICE—No. 826—6-inch 125-pound R-S "H" metal valve used on small turbine generator. Equipped with 18—8 shafts, hastelloy bushings, finned lubricated stuffing box and solenoid trip mechanism.

STEAM SERVICE—No. 677—1500-pound welding end steel valve for superheated steam—A. S. M. E. Standards.



SEMI-SOLID SERVICE including abrasive and corrosive materials.

R-S VALVES
Control and Shut Off Practically Any Material

The beveled vane seats firmly at a 12½° angle and is closed from a fully open position through 77½° of arc by either manual or automatic operation. A metal-to-metal seat gives satisfactory commercial shut-off. When required, Monel or stainless steel can be welded to the vane periphery and a babbitted seat used in the valve body. Drip tight or bubble tight closure can be obtained with a rubber seat.

Power controlled prime movers delivering the necessary foot pounds of torque open or close these self-cleaning valves at any desired speed from one second to eight minutes according to requirements. Pressures range from 2 to 2500 psig and temperatures from minus 300° F. to plus 2000° F.

Such simplicity of design, adaptability and operating ease are the reasons why R-S Valves can be installed to control and shut off the volume and pressure of any material that flows or is forced through a pipe.

Obtain full details from your R-S representative.

R-S PRODUCTS CORPORATION
4600 Germantown Avenue, Philadelphia 44, Pa.

An S. Morgan Smith Company Subsidiary

DISTRICT OFFICES IN PRINCIPAL CITIES

ELLIOTT
CROCKER-WHEELER
Squirrel-cage
INDUCTION MOTORS
NEMA Frames 203-505

"All the best of all best features"

Horizontal C face mounting, frame with feet.

Splash-proof

Vertical flange mounting

Brake Motor

SEALED PRELUBRICATED BEARINGS
Requiring no attention and assuring years of service.

ALUCAST ROTORS
Practically indestructible. Bars, fans, and end rings are die cast, forming one solid piece.

DUAL VENTILATION
Cooling air is pulled in at each end of rotor, discharged around the stator and out each side of the frame.

VINYLASTIC WIRE
On all stators, the assurance of long life in thoroughly impregnated and baked vinyl-covered wire.

CORDED END TURNS
For strength and permanence.

PHASE-TO-PHASE INSULATION
Gives the extra life of insulating windings between phases.

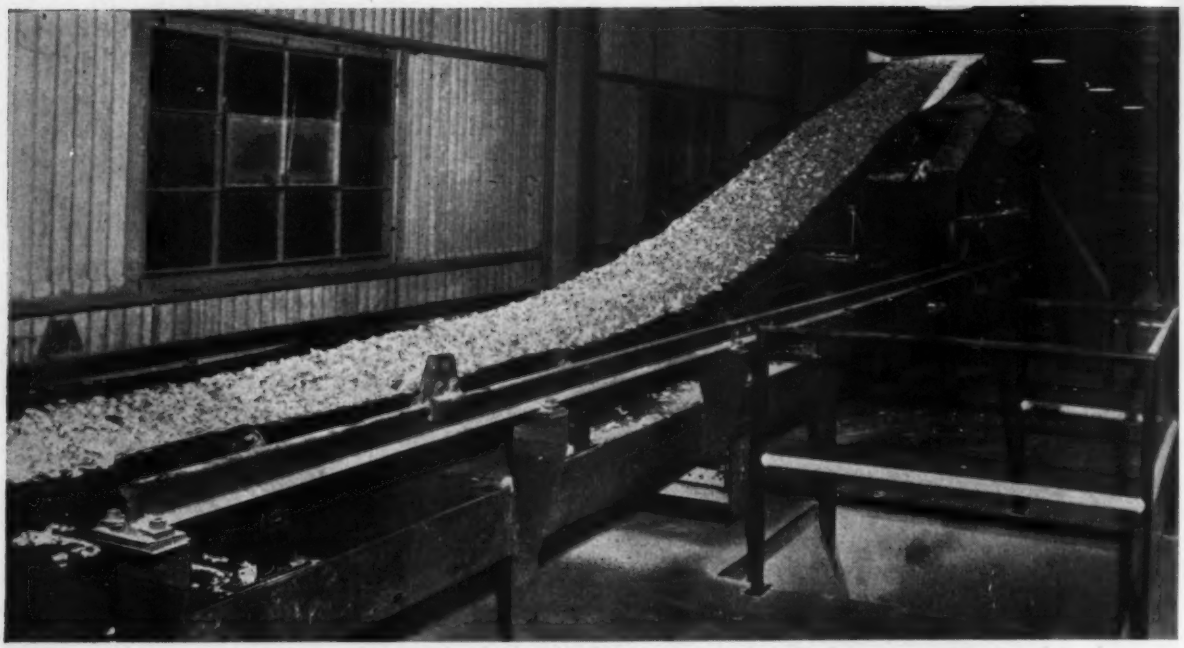
Full details in Bulletin PB 6000-1, on request.

ELLIOTT Company

CROCKER-WHEELER DIVISION
AMPERE, N. J.

W2-12

For large motors: RIDGWAY DIV., RIDGWAY, PA.
Plants at: JEANNETTE, PA. • RIDGWAY, PA. AMPERE, N. J. • SPRINGFIELD, O. • NEWARK, N. J.
DISTRICT OFFICES IN PRINCIPAL CITIES
ELLIOTT APPROVED SERVICE SHOPS COVER THE COUNTRY



Wood chips are carried to digesters at southern newsprint mill by Link-Belt 36-in. belt conveyor and motor-propelled tripper.

Why LINK-BELT belt conveyors are first choice in so many industries . . .

Engineering experience plus quality components combine to cut handling costs

EFFICIENCY in moving materials makes the difference between profit and loss in many operations. That's why it's so important to make sure you get the *right* belt conveyor system for your needs.

And there's no surer way of meeting your specific operating requirements than by calling in Link-Belt. Our belt conveyor specialists can efficiently engineer the system and recommend the correct components from Link-Belt's complete line of idlers, trippers and terminal machinery. And Link-Belt can match your needs in associated equipment—other types of conveyors, feeders, elevators, car dumpers and shakers.

Equally important, with such a tremendous background in belt conveyor application, Link-Belt is in an ideal position to follow through on every detail of your job—from planning through erection, if desired. One source—one responsibility.

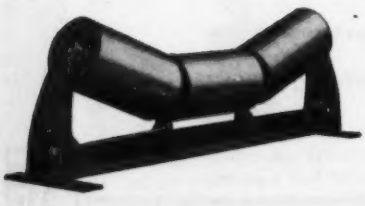
Link-Belt will gladly work with your engineers or consultants. There's a Link-Belt office in the principal city near you.

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, Duluth 2, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa), Sydney (Australia). Offices in Principal Cities. 12,725-B

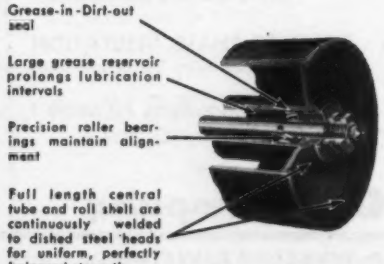
LINK-BELT

BELT CONVEYOR EQUIPMENT

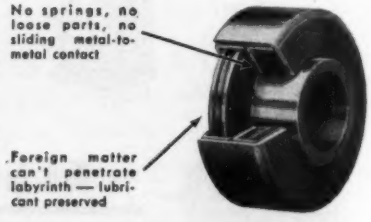
LINK-BELT Roller Bearing Idlers provide free-rolling, long life



Standard for Industry—L-B "100" Idler


Grease-in-Dirt-out seal
Large grease reservoir prolongs lubrication intervals
Precision roller bearings maintain alignment
Full length central tube and roll shell are continuously welded to dished steel heads for uniform, perfectly balanced strength

Less lubrication and adjustment


No springs, no loose parts, no sliding metal-to-metal contact
Foreign matter can't penetrate labyrinth — lubricant preserved

Grease-In-Dirt-out Seal

Putting the squeeze

on costs

Clean, strong pulps at lower cost... that is the reason Pressure Washing Systems are being installed in many of the largest and most progressive mills in the industry today. Here are some of the ways that costs are squeezed:

Heat economy . . . Wash-water temperatures exceed 200°F, greatly reducing evaporator costs.

Low water consumption . . . less than 200 g.p.m. for a 300-ton system . . . minimum stream pollution.

Low power requirements . . . actual horsepower consumed by a typical 3-stage, 300-ton system is only 1.36 per air-dry ton.

Low labor costs . . . one man controls entire system from a single switchboard.

Low maintenance . . . facing on compression elements has a probable life of at least 100,000 tons, and is easily renewable.

Low capital investment . . . appreciably below conventional systems.

Systems can be furnished in two, three, and four stages to fit individual mill needs.

Write for complete information today.

patent pending

Sales & Service

SUTHERLAND REFINER CORPORATION

Trenton 8, N. J.

Manufactured by

VALLEY IRON WORKS CO., APPLETON, WISCONSIN

Designed & Engineered by

SUTHERLAND, INC.

are you opening up sales opportunities?

You are if YOUR paper is made from Curlated pulp and has all of these *plus* properties . . .

1. Maximum Tearing Strength
2. Maximum Stretch
3. Maximum Bulk
4. Maximum Bending Properties
5. Maximum Cleanliness
6. Maximum Cross Directional Strength

Only obtainable by Curlation

Yes, only Curlation can give your paper *all* these properties mechanically because Curlation not only changes the shape and diameter of fibers, but reduces fiber bundles and dirt. Curlator's patented rubbing and rolling process twists and flexes fibers under pressure . . . changes them permanently from straight to "curled." Thus more desirable properties are imparted to the finished paper than would be possible with straight (uncurlated) fibers.

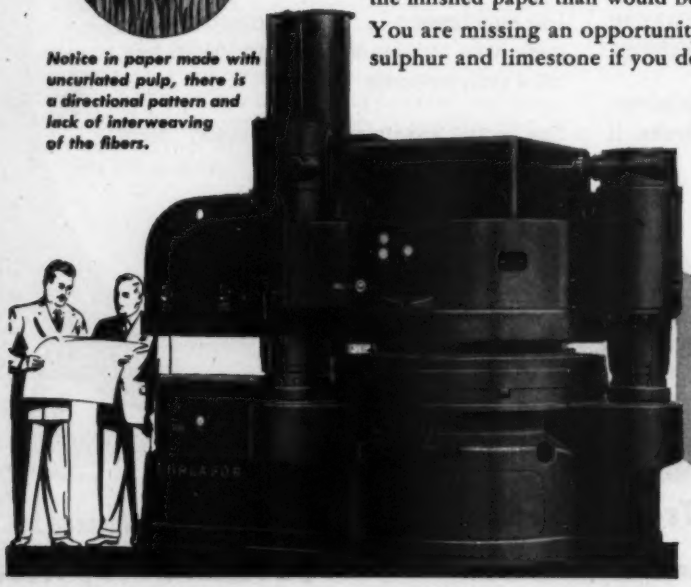
You are missing an opportunity to upgrade pulp, save on wood, coal, sulphur and limestone if you don't investigate Curlators.

WRITE *today for more detailed information.*

Let's look at **CURLATION . . .**

Notice that in paper made with Curlated pulp, the fibers are interlocked and lie in every possible direction.

Notice in paper made with uncurlated pulp, there is a directional pattern and lack of interweaving of the fibers.

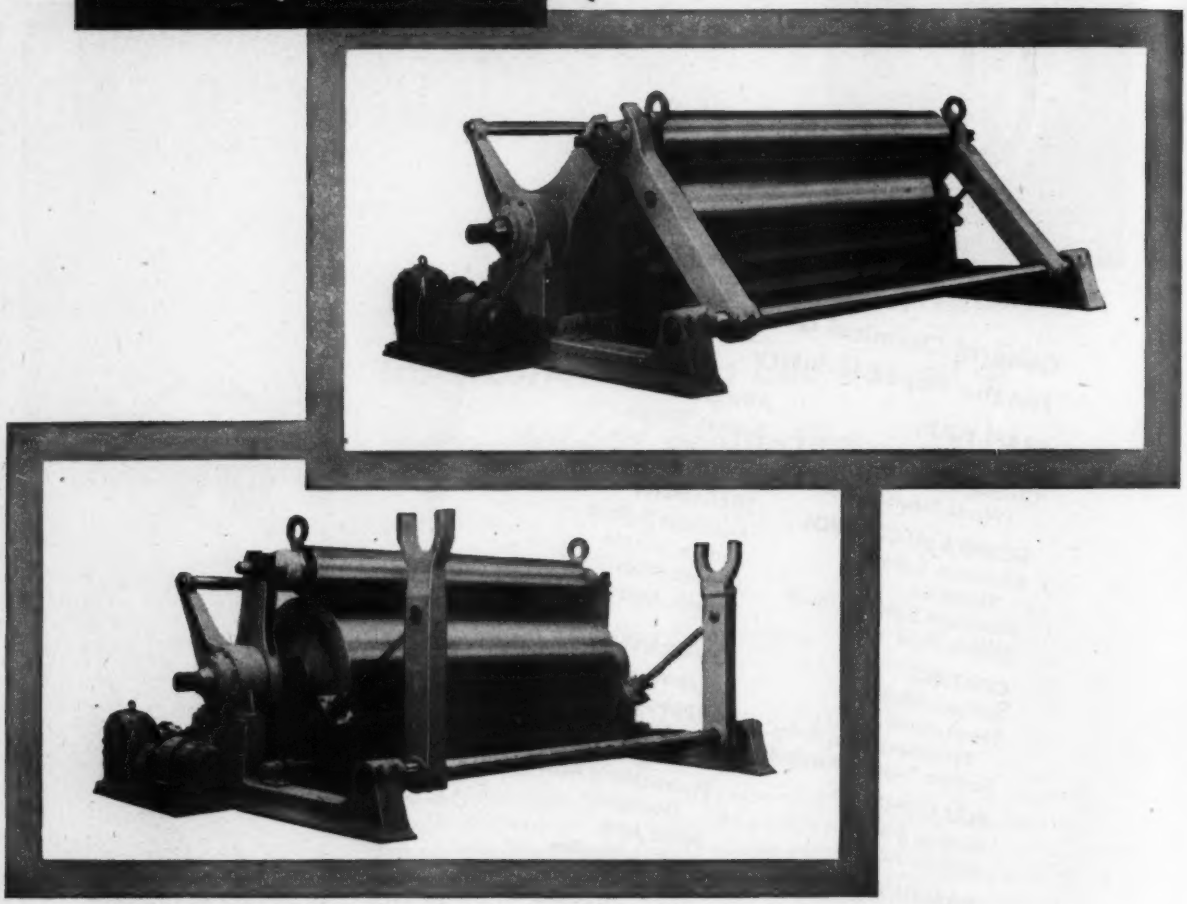


CURLATOR†
Corporation
565 BLOSSOM ROAD • ROCHESTER 10, NEW YORK

†T. M. Reg.—Curlator Corporation, Rochester, N. Y.

PAPER...*one of 187 industries served by General Chemical*

an improved and simplified reel by Black-Clawson



Here is a Black-Clawson improved and simplified uniform-speed reel. Take a look at it.

This reel is designed for simplicity and for complete control by the operator.

Air cylinders on the secondary arms control the pressure and uniformity of the winding roll on the reel drum face. The motor-operated primary arms provide easy transfer of the reel spool to the secondary arms.

The Doctor is air-operated for quick in and out contact with reel drum to prevent sheet wrap of drum during reel changes.

It is definitely a push-button controlled reel and it can be built to wind rolls for any and all requirements.

For technical description, get in touch with the Black-Clawson Hamilton Division.

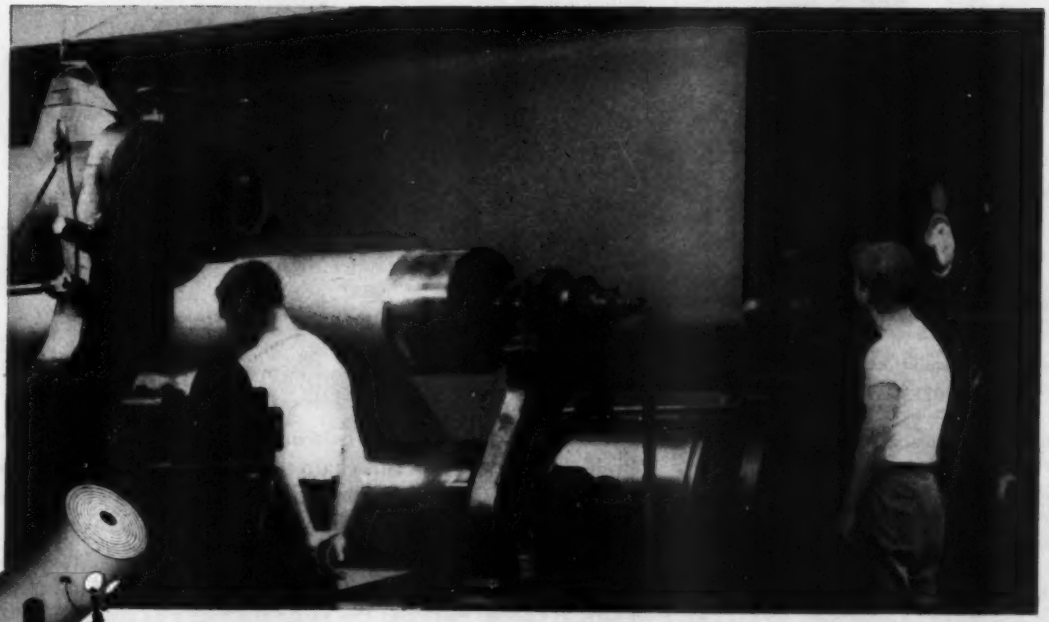
The Black-Clawson Co., Hamilton, Ohio

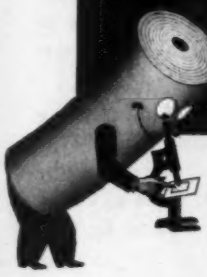
SHARTLE BROS. MACHINE CO., Middletown, Ohio • DILTS MACHINE WORKS, Fulton, New York
Northern Sales Office: 814 N. Superior St., Appleton, Wisc. • *Southern Sales Office:* 937 Coventry Road, Decatur, Georgia
Western Sales Office: Mayer Bldg., Portland, Oregon • *Associate:* THE ALEXANDER FLECK LIMITED, Ottawa, Ontario
Subsidiary: B-C INTERNATIONAL LTD., Greener House, 66/68 Haymarket, London, S. W. 1, England

NEW!

WOODBERRY RAYCORE DRYER FELT

Woodberry 171 raycore all-cotton dryer felt gives low-cost performance





Scientific construction makes the big difference

- Construction Engineered To Eliminate Stretch on Machine
- Open Back Gives High Porosity For Faster Drying
- Nylon-Sewed Clipper Seams With Stainless Steel Insert Available If Desired

Mt. Vernon-Woodberry Mills

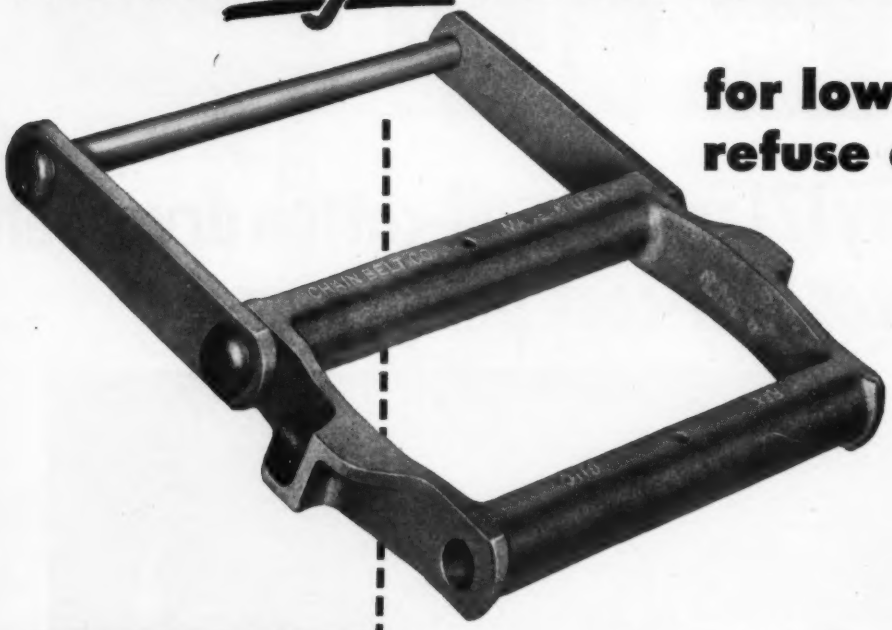
BRANCH OFFICES: CHICAGO • ATLANTA

TURNER HALSEY COMPANY
Selling Agents
40 WORTH ST NEW YORK

BALTIMORE • BOSTON • LOS ANGELES

The Right Combination

for low-cost refuse conveying



Side view, notice the heavy wearing shoes on the edges of the side bars of the *invertible* block link; and the shoe reinforcement, or rib, which also serves to move material. Barrels contain large grease chamber. There is added metal behind the rivet which lengthens chain life.

For a better job of conveying sawdust, refuse, wood chips and similar material, Rex® has developed the new Combination-Type Mill Conveyor Chain No. 6110. It is the ultimate in H-type conveyor chain . . . far superior to the ordinary H-type chain which it is designed to replace.

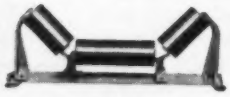
Block links of malleable iron or Rex Z-Metal, and side bars of high carbon steel give this chain the toughness to stand up under long, hard, continuous service. Rivets are specially made to reduce possibility of breakage resulting from momentary overload and corrosion fatigue.

Here's a chain that is sure to slash overall refuse handling costs. It can be run over the same sprockets as ordinary H-type chain. Your Rex Field Sales Engineer is anxious to give you the complete story. Call him today, or if you prefer, write to Chain Belt Company, 4714 W. Greenfield Ave., Milwaukee 1, Wis.

OTHER POPULAR REX MILL EQUIPMENT

Rex H-Type Drive Chain

Rex Chabelco® Chain



Rex Wood Chip Idlers

Baldwin-Rex® Roller Chain

Rex Temperim® Sprockets

CHAIN BELT REX COMPANY ®

Chain Belt COMPANY OF MILWAUKEE

Atlanta • Birmingham • Boston • Buffalo • Chicago • Cincinnati • Cleveland
Dallas • Denver • Detroit • El Paso • Houston • Indianapolis • Jacksonville
Kansas City • Los Angeles • Louisville • Midland, Texas • Milwaukee • Minneapolis
New York • Philadelphia • Pittsburgh • Portland, Oregon • Springfield,
Mass. • St. Louis • Salt Lake City • San Francisco • Seattle • Tulsa • Worcester

Distributors in all principal cities in the United States and abroad

All these Valves . . . from One!

Valve combinations for 90% of industrial piping assembled with 4 bodies and a handful of parts.

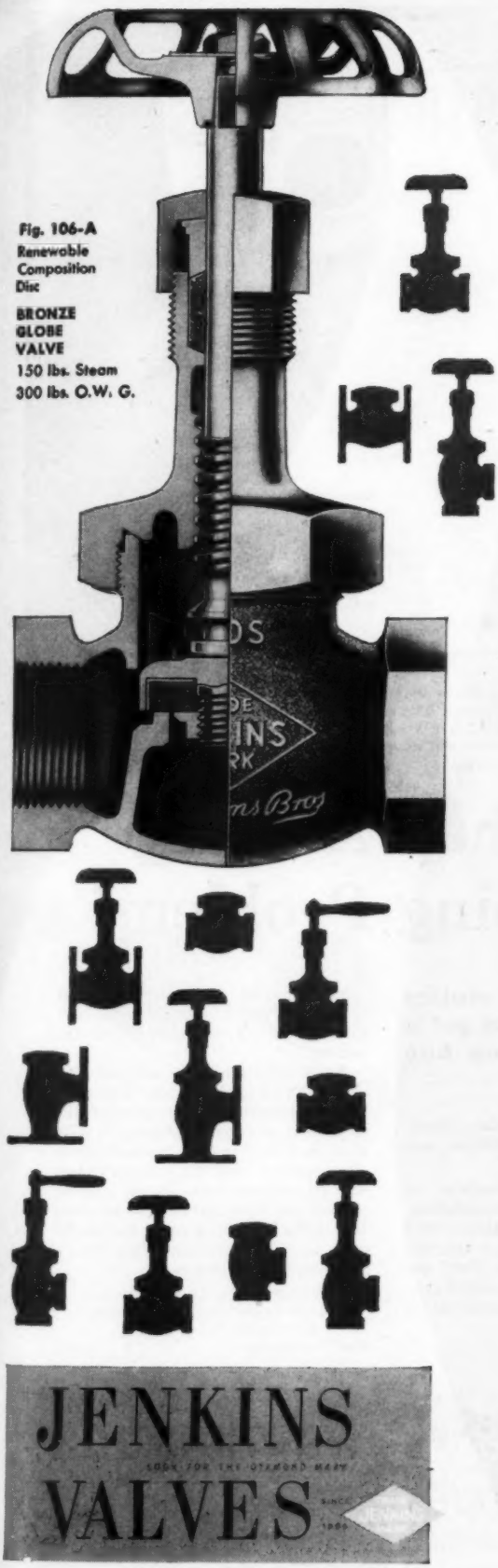
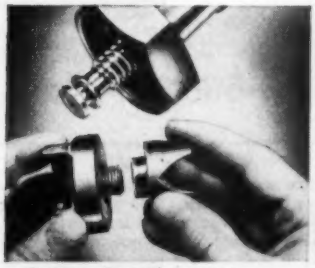


Fig. 106-A
Renewable Composition Disc

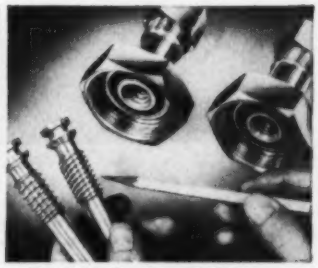
BRONZE GLOBE VALVE
150 lbs. Steam
300 lbs. O.W. G.

JENKINS FIG. 106-A "FAMILY"

Start with the standard Fig. 106-A. Trimming is interchangeable in Globe or Angle body, screwed or flanged.

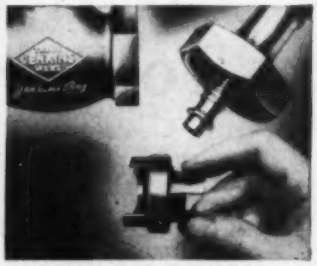


For Close Control — In throttling service, the nut which holds the disc in the disc holder is removed and replaced with Throttling Nut, Fig. 344.



For Quick Opening and Closing — Merely substitute the bonnet and spindle from Fig. 941, in which threads are pitched more sharply.

For Lift Check Service — Globe or Angle Bodies can be fitted with interchangeable Cap, Disc Holder, and Guide Disc Nut from Fig. 117A. Addition of spring from Fig. 655A provides spring loaded service.



For Stop & Check Service — Use the 106A trim, but substitute this spindle from Fig. 630A and replace the regular disc nut with the check valve guide disc nut.

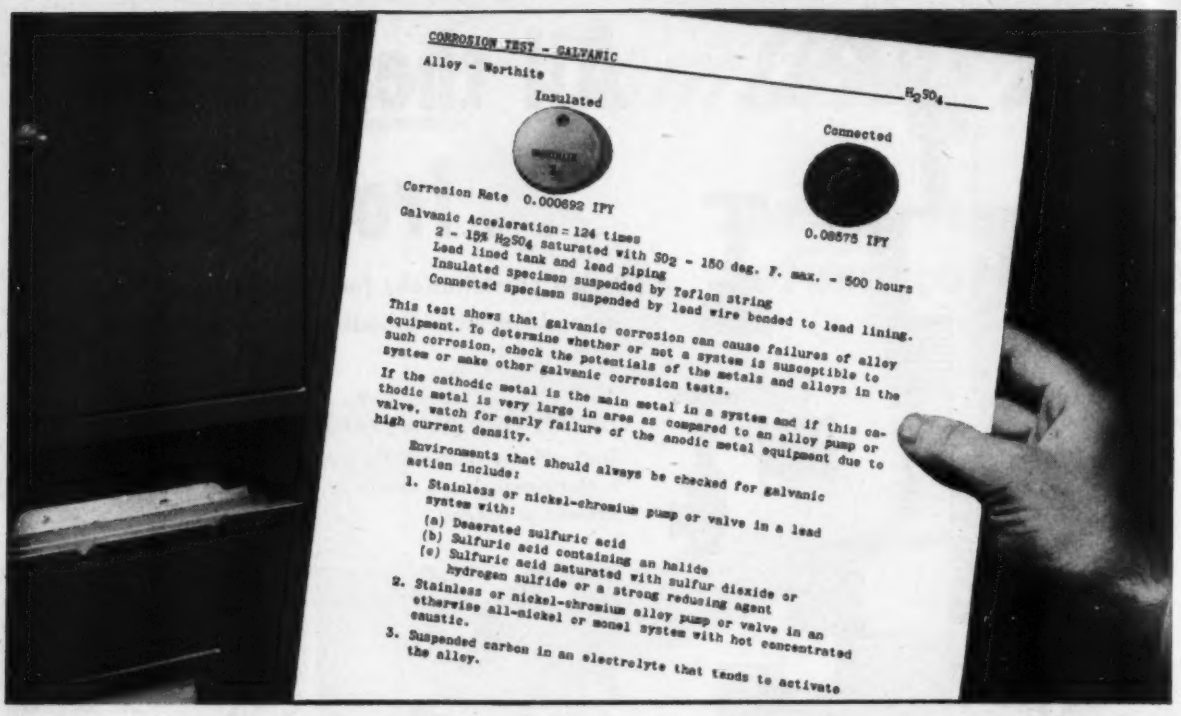
Look over these pictures and see how easy it is to make up just the valve type you need, simply by interchanging parts. Think of the saving this means in maintenance expense . . . in reduced inventory of spare valves in your stockroom.

That's a big reason why the Fig. 106-A series takes top honors in any poll for valve preference. And Jenkins time-proved design, makes them the longest-lasting, lowest-upkeep valves that money can buy.

For example, see the heavy construction of the one-piece, screw-over bonnet. You can remove and replace it over and over again without distortion. See the extra size packing box,—and the perfectly machined threads on the heavy manganese bronze spindle, with more threads in contact with the bonnet, open or closed.

Remember, Jenkins Bros. is the originator of the renewable composition disc valve,—the *only* manufacturer of both valves *and* discs. For drop-tight, trouble-free performance, get acquainted with the Fig. 106-A "family". Despite their extra value, *you pay no more* for Jenkins Valves. Jenkins Bros., 100 Park Ave., New York 17, N. Y. Jenkins Bros., Ltd., Montreal. Sold through leading Industrial Distributors.

JENKINS VALVES


CORROSION TEST - GALVANIC
Alloy - Worthite
H_2SO_4
Insulated
Connected
Corrosion Rate 0.000892 IPY
0.08575 IPY
Galvanic Acceleration = 124 times
2 - 15% H_2SO_4 saturated with SO_2 - 150 deg. F. max. - 500 hours
Lead lined tank and lead piping
Insulated specimen suspended by Teflon string
Connected specimen suspended by lead wire bonded to lead lining.
This test shows that galvanic corrosion can cause failures of alloy equipment. To determine whether or not a system is susceptible to such corrosion, check the potentials of the metals and alloys in the system or make other galvanic corrosion tests.
If the cathodic metal is the main metal in a system and if this cathodic metal is very large in area as compared to an alloy pump or valve, watch for early failure of the anodic metal equipment due to high current density.
Environments that should always be checked for galvanic action include:
1. Stainless or nickel-chromium pump or valve in a lead system with:
(a) Deaerated sulfuric acid
(b) Sulfuric acid containing an halide
(c) Sulfuric acid saturated with sulfur dioxide or hydrogen sulfide or a strong reducing agent
2. Stainless or nickel-chromium alloy pump or valve in an otherwise all-nickel or monel system with hot concentrated caustic.
3. Suspended carbon in an electrolyte that tends to activate the alloy.

A CASE STUDY FROM THE WORTHINGTON FILES. This Worthington test sheet indicates that the galvanic action could be virtually eliminated in this manufacturer's system by *insulation*—that is, a complete separation of the alloy pump from metallic contact with lead surfaces. The recommendation was made to him as a result of a Worthington test made on the solutions his system was pumping.

It Takes More Than A Pump To Solve A Pumping Problem!

Worthington's files are packed with many stories like this one. Each is proof positive that you get a lot more than a Worthite* pump when you buy from Worthington.

It was the age-old problem of chemical pumping, corrosion. But this customer found a way out—a *practical solution* that saved him plenty of expense in extra maintenance and lost production time.

He wrote a letter to Worthington. Could we tell him whether there was anything he could do to slow down or stop this corrosion? He was pumping a 15% solution of sulfuric acid saturated with sulfur dioxide. Maximum temperature of solution was 150° F.

This wasn't a new problem for Worthington corrosion specialists. Experience had shown them that under these conditions galvanic action could be his trouble. They ran the test illustrated above which conclusively proved these assumptions correct.

Result? The customer insulated the system and his troublesome corrosion problem was brought under control.

At Worthington, we welcome the chance to hear about *your* pumping problems—either on a present installation or in the design of a new system. For it is only through such close contact with the industry that we can continue to build the kind of pumps and offer the kind of services that have led pump users the world over to the conclusion that *there's more worth in Worthington.*

Worthington Corporation,
Centrifugal Pump Division,
Harrison, New Jersey.

*Reg. U. S. Pat. Off. C.1.6

Type CG and CGL. Sizes ¾" to 10". Capacities to 5000 GPM; heads to 200 ft. Liquid ends of WORTHITE.

Type CF. Sizes 1" to 4". Capacities to 1000 GPM; heads to 130 ft. Standard all iron and all bronze.

Type CQ. Sizes 1½" to 3". Capacities to 600 GPM; heads to 130 ft. at 1750 RPM. Closed impeller.

Type L. Sizes 3" to 8". Capacities to 2250 GPM; heads to 300 ft. Single stage volute. For general service.

WORTHINGTON
Centrifugal Pumps

The World's Broadest Line Assures You the Right Pump for Every Job

USE BECCO HYDROGEN PEROXIDE

FOR Low, Moderate or
High Density Bleaching
Continuous or Batch Bleaching
Steep Bleaching
Super-Bleaching
Paper Machine Bleaching
De-Inking

OF Groundwood
Chemigroundwood
Semi-Chemicals
Sulfite
Sulfate
Soda
Agricultural Residues
Flax
Bamboo

BECCO SALES CORPORATION, Station B, Buffalo 7, N. Y.

Please send me information on: _____

_____

NAME _____

COMPANY _____

STREET _____

CITY _____ ZONE ____ STATE _____ PI-6-52

BECCO SALES CORPORATION

Sales Agent for BUFFALO ELECTRO-CHEMICAL COMPANY., INC.
BUFFALO - BOSTON - CHARLOTTE - CHICAGO - NEW YORK - PHILADELPHIA - VANCOUVER, WASH.

You can't think of felts

without thinking of

HAMILTON FELTS

As a mill man, you are a practical man, not given to abstract thinking. Even such a common word as *paper* suggests to your mind the particular product you are manufacturing—book, bond, writing, tissue, kraft or board.

You think of what furnish goes into it; how it is reduced to proper consistency by the jordans and beaters; how it travels from the fourdrinier or the cylinders on the felt that carries it through the press and to the driers.

And you can't possibly think of felts without thinking of Hamilton Felts. You know that all felts look much alike and that they are the most perishable items of machine equipment.

Yet you somehow know that Hamilton Felts remove water faster; last longer; give finer finish to your sheets. And that is why you can't think of felts without thinking of Hamilton Felts.

MIAMI WOOLEN MILLS

Established 1858

Hamilton Felts

● From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost.

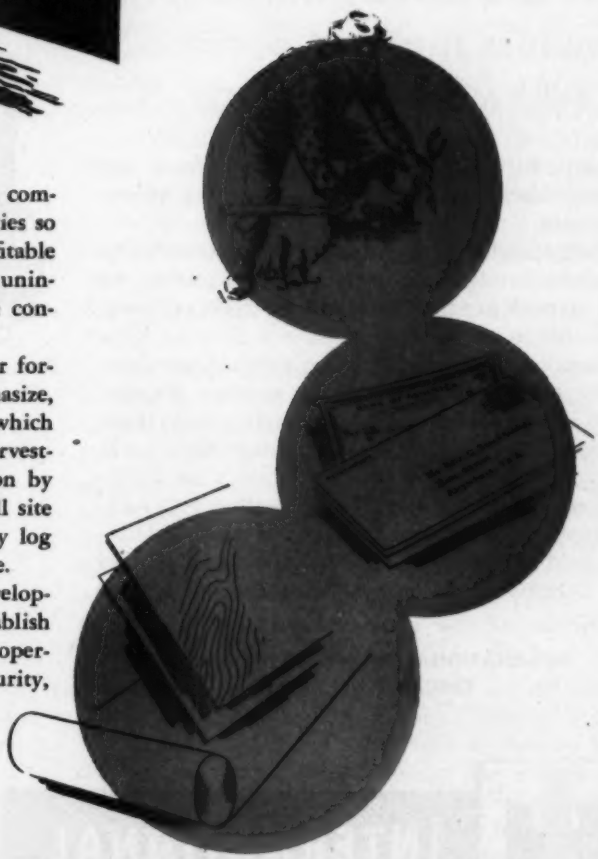
SHULER & BENNINGHOFEN, HAMILTON, OHIO

A Statement OF THE WEYERHAEUSER OPERATING POLICIES

The Weyerhaeuser Timber Company is committed to the policy of operating its properties so that they will provide continuous and profitable employment for its workmen . . . and furnish uninterrupted supplies of forest products to the consuming public.

In brief, the basic policies which guide our forestry and mill management practices emphasize, first, recurrent forest yield by tree farming . . . which provides for the growing, protecting and harvesting of trees; secondly, whole crop utilization by grouping different kinds of mills on one mill site . . . which will permit processing all of every log at the mill for maximum use and dollar value.

Augmented by long range research and development programs, these practices will help establish a permanent forest industry . . . the continuous operation of our mills providing greater job security, a reasonable and necessary investment return, and achieving the ultimate objective of assuring quality forest products for use by our customers.



PULP POWER where it counts

TD-14A. 65.9 horsepower at the drawbar . . . Gasoline-conversion all-weather starting . . . Steering clutch boosters . . . Six speeds forward, two reverse . . . Positive track alignment . . . Unit construction for easy servicing.

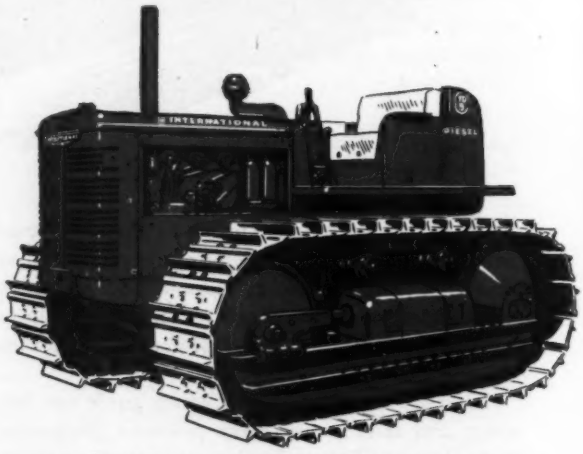
Here are three International crawlers that put profit in pulpwood skidding

Versatile International crawler tractors have just what it takes to maintain fast pulpwood skidding schedules.

Their speed, power and handy maneuverability get them in after big loads in tough terrain, to rack up peak production records or snake out your allowable in less time.

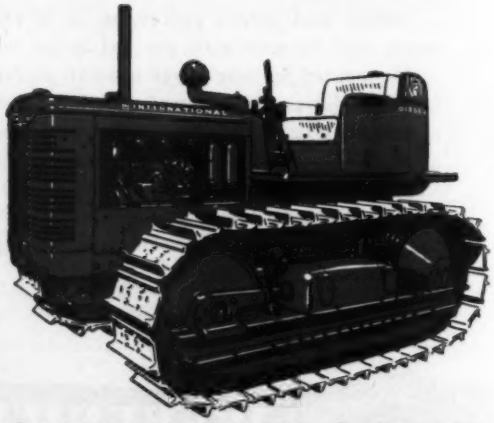
Gasoline-conversion starting systems get them on the job fast even in the coldest weather. Rugged main frames and durable track rollers keep them going for hundreds of hours of no-downtime work.

And wherever you operate, there's an International Industrial Distributor nearby with well-equipped shops, complete stocks of parts and mobile field service. Ask him for details today—and put International *"Power that Pays"* to work for you!



TD-9. 41.3 horsepower at the drawbar . . . Gasoline-conversion all-weather starting . . . five speeds forward, one reverse . . . Positive track alignment . . . Unit construction for easy servicing.

INTERNATIONAL HARVESTER COMPANY
CHICAGO 1, ILLINOIS



TD-6. 33.78 horsepower at the drawbar . . . Gasoline-conversion all-weather starting . . . five forward speeds, one reverse . . . Positive track alignment . . . Unit construction for easy servicing.

INTERNATIONAL HARVESTER

INTERNATIONAL

POWER THAT PAYS

The Paper Industry

June 1952

A reminder

Central and eastern states have already experienced damaging blows from forest fires. A blaze in northern Minnesota engulfed more than 200 acres of timberland during one April week-end. In Michigan, conservation officials see trouble ahead if the current high rate continues. Thus far this year 432 fires have swept across 3,245 acres in that state. The fire danger in many areas is way above normal, and with tourists beginning to take to the highways, the coming summer months threaten severe losses to valuable forests.

United States Forest Service warnings have been issued for regions throughout the nation. With low humidity and little rain, the usual danger has been multiplied. Carelessness in the woods is not the habit of any one group of people. We are all forgetful. A reminder now could save thousands of acres tomorrow.

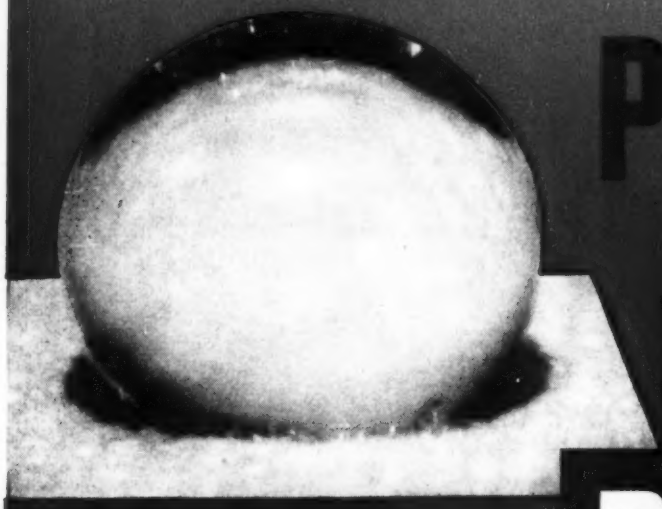
Pulp washing to baseball

An old friend in new dress will welcome papermakers to Detroit June 17. When the 33rd Annual Meeting of the Superintendents Association convenes, the proved formula of proper amounts of work and play will appear in 1952 fashion. Those attending from all parts of the United States and Canada are certain to recognize the event but are equally sure to find its new garb becoming.

Demonstrating the months of work that have gone into this year's edition is the well-balanced variety displayed by the program. Technology will naturally again hold the spotlight, for the purpose of trade gatherings is, after all, progress in the industry concerned. New developments in processes and methods in any field of manufacture in these years of almost unbelievable advance come with a rapidity with which mere mortals cannot possibly keep pace. That is why the "working" phase of a convention such as this is so vital. In papermaking, as in few other industries, such developments must be reviewed constantly. Creation of a better product more economically may well mean the difference between profit and loss. It is therefore a practical prerequisite that delegates to Detroit show interest and participation in the group meetings that will concern themselves with the various aspects of the following subjects: sulphite, kraft, paperboard, plant and power engineering, high-yield pulping, paper converting, production methods, and paper machines.

Nonetheless important, however, in achieving well-rounded good from the Superintendents meeting will be full attention to the meetings and activities outside the realm of the scientific. No firm can be operated efficiently without complete knowledge of, for instance, economics, labor relations, management's responsibility, trade conditions. Likewise, knowledge of what others in the industry and in allied fields are doing is indispensable to up-to-date plant operation. Plant visits planned for the Detroit meeting will provide ample opportunity.

Then there is the "playing" phase of any convention —in its way just as important as the "working" aspect. The annual Wake 'Em Up Breakfast is always a welcome retreat. Golf at a nearby country club will provide conviviality, as will the familiar parties that accompany all large gatherings of this sort. And just how the guest speaker at the Wednesday banquet will find the proper tie-in with the over-all convention picture will have to remain a mystery. But Ford C. Frick, commissioner of baseball, will without a doubt mesh as smoothly in the activities of the three-day gathering as will the meeting on pulp washing. Scorecards are made of paper.

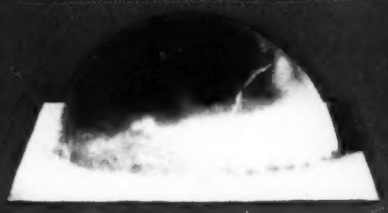


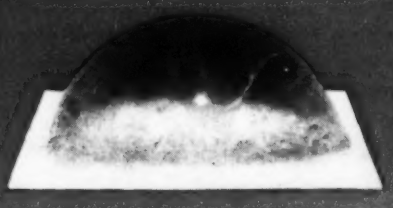
PROOF

WHY MORE AND MORE MILLS USE

PEXOL*

FOR ANY TYPE OF SIZING





Here's graphic proof of the versatility of Pexol—Hercules fortified size. These photomicrographs (greatly magnified) of drops of water show a few of the contact angles you get with Pexol.

You can get the right degree of water repellency with less trouble, and at less cost, with Pexol—in dry or paste forms. That's why more mills today use Pexol than all other fortified sizes combined.

Actual figures from satisfied customers prove that Pexol is saving them millions of dollars a year. Take the first step in getting your share of these amazing savings by sending now for detailed information.

Paper Makers Chemical Department

HERCULES POWDER COMPANY
INCORPORATED

961 King Street, Wilmington 99, Delaware

SIZING MATERIALS AND CHEMICALS FOR PAPER

*TRADE MARK

PP52-5

The Paper Industry Current Comment

Newsprint price hike

Moans of agony rising from the newspaper publishing industry over the Canadian newsprint price increase from the previous $116 per ton to $126 once again emphasize the fact that while this country is hurtling toward the British labor type of government with its attendant evils, Canada has become the world's greatest exponent of free enterprise.

There is just one reason for the Canadian increase: Canada's prosperity has been so great in comparison to this country's vacillating efforts to prevent inflation that the Canadian dollar is today worth nearly $1.018 in United States currency. The Canadian increase of $10 per ton is to give the Canadians the same Canadian dollar return on their sales to the United States that prevailed when Canadian and United States currencies were on a par.

Washington agrees with Canada that the increase is due to rising production costs, coupled with the increasing value of the Canadian dollar. Protests to Canada by government officials only produced a reply that the increase will not be forbidden. Washington, it can be assumed, will not authorize a comparable increase in price to the domestic newsprint mills, but as Canada provides three quarters of the United States consumption, newspaper publishers see losses aggregating $50,000,000 a year, with possible disaster for some of the less well financed newspapers.

It takes approximately eight 8-page papers to weigh one pound. It is apparent, therefore, that recent increases in prices by domestic newspapers are intended to cover other production costs than those due to the price of newsprint, which now will be roughly 6.3 cents per pound.

To what extent the United States will try to retaliate for the Canadian action remains to be seen. Rep. Celler has introduced a bill in the House to require domestic corporations to produce records of their foreign affiliates if they are to do business in this country. This is obviously intended to apply to American-owned Canadian newsprint mills. The answer to this and other efforts to force Canada to meet United States demands is clear—a transfer of much of Canada's newsprint output from United States to other foreign customers, who are willing and anxious to pay more than the United States price to secure the needed paper. The first retaliatory action suggested by this country is a curtailment of United States exports of sulphur to Canada in the hope that Canadian mills would rather lose money on newsprint sales than be forced to reduced operations by a lack of this essential material.

Tariff reductions

Meanwhile, the State Department is vociferous in its statements that this country will proceed on its program to expand international trade by further reductions of American tariff rates—already the lowest in the world. Oblivious of the fact that the placing of newsprint on the free list puts United States consumers at the mercy of a foreign near-monopoly, there is no hesitation in suggesting that the same policy be applied to other commodities. The nations which are protesting most loudly at American quota restrictions on some commodities are those who have benefited most by American concessions in the past. Protests from abroad are even heard against the use of escape clauses in trade agreements to stop damaging competition with American industry. The United States Tariff Commission, which hears such complaints and which has only acted once in behalf of domestic industry, has been tacitly warned by Administration voices to bear down hard on domestic interests which seek a restoration of reasonable duty rates.

No more golden eggs?

All of this is one more evidence that the current national economic policy is killing the goose that lays the golden eggs of profits. A survey by the National City Bank of New York shows that in about 450 representative manufacturing companies profits before taxes in the first quarter of 1952 were 12 per cent smaller than in the comparable period a year ago, though aggregate sales were 1 per cent higher. Another phase of this problem is the fact that federal income and excess profits taxes from these companies were 11 per cent less than in the same quarter of 1951. The result is that the common man must make up the difference.

The steel dispute points out this situation most concisely. The demanded wage increase recommended by President Truman's program would come out of steel company profits, and if this continues and the federal budget remains high, there is no alternative than a further boost in individual and corporation tax rates. This spiral is the surest means of destroying industrial incentive that could be devised.

Politics and decontrols

Washington is, and will for weeks to come, be a maelstrom of political and industrial maneuvering. Some decontrols are in the making, and the fact that some controls have been lifted is evidence that the need for control is chiefly based on the wish of Washington empire builders to hold their jobs. There are more civilian employes of the government than ever before in history. Economy is being preached but not practiced.

The question of price and wage controls is before Congress at the moment of this writing, with a measure under consideration to extend the Defense Production Act after its expiration in a few weeks. It seems certain that some measure will be passed, but with severe restrictions included, tieing the hands of the bureaucrats. For instance, it may include a provision restricting the power of the President to seize industry. It is almost certain that the Wage Stabilization Board, which recommended the wage increases for the steel workers, will find its authority strictly defined, to prevent a recurrence of such rulings as resulted in the seizure of the steel industry.

Meanwhile, the paper industry picture is not too rosy. Several southern kraft pulp mills have reduced their prices, and other grades may follow this lead, which puts the price of unbleached kraft pulp to $125 per ton, or $7.50 below the

allowable ceiling. Paper production is well below last year's figures.

In the face of this situation, the International Bank for Reconstruction and Development has granted Finland a $20,000,000 loan, of which about half is for the wood-using industries. The Finnish pulp and paper industry is planning a 20 per cent increase in wood pulp capacity, a 25 per cent increase in newsprint capacity, and a 100 per cent increase in paperboard capacity. With most of this money coming from the United States, in addition to two previous similar loans, this country is financing the expansion of an industry whose chief market is in the United States competing with our mills.

A pertinent suggestion is, who will bail the United States out of bankruptcy after it has put the rest of the world on its financial feet.

Another straw in the wind is an effort of the city of New York to save its financial face by a series of new taxes, one of which would be a 3 per cent sales and use tax on containers, wrapping and packing materials. The only types of containers to be exempted would be those which go with the merchandise to the ultimate consumer.

Wood supply

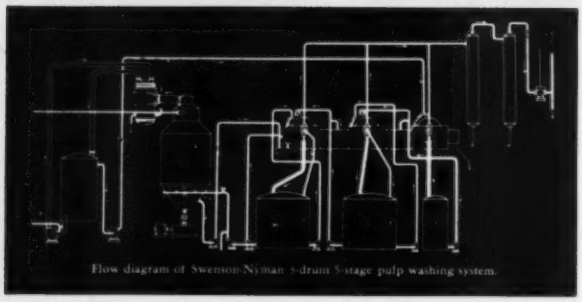
The problem of adequate wood supply for the paper mills in the South was the subject of a recent conference between officials of the United States Forest Service and industry representatives. The industry has done a tremendous job in selling the idea of small owner forestry to woodlands owners, but the Forest Service fears that the supply in sight is inadequate to present needs and that more intensive efforts must be made to increase pulpwood production by tree farm owners.

The Federal Trade Commission has issued another blast at the paper industry in criticism of the policy of large integrated paper mills to hold control of their pulpwood acreage and cut only the pulpwood needed for their own use, rather than produce pulp for sale to less well situated companies. This policy, says the F.T.C., makes it difficult for smaller pulp companies to finance the purchase of woodlands adequate to supply their needs. Individual companies which are concentrating their acquisition of woodlands are mentioned by name. In effect they are criticized for not operating their properties in the interest of their competitors.

Financial Reports

Paper mill securities in most cases were somewhat weaker during the month, but the dullness in other industrial stocks was manifest here also. In-

PULP IS WASHED CLEANER with Swenson-Nyman Equipment



Flow diagram of Swenson-Nyman 3-drum 5-stage pulp washing system.

REDUCES DILUTION through multistage operation

CUTS STEAM COSTS by reducing evaporator loads

ELIMINATES SEWER LOSS because it operates as a closed system

REDUCES SALT CAKE LOSS to the small amount (20 to 50 lb per ton) passing through with pulp

Send for Bulletin E-108

- Evaporators
- Pulp Washers • Deckers • Filters
- Digester Blow Condensers
- Surface Condensers
- Turpentine Condensers

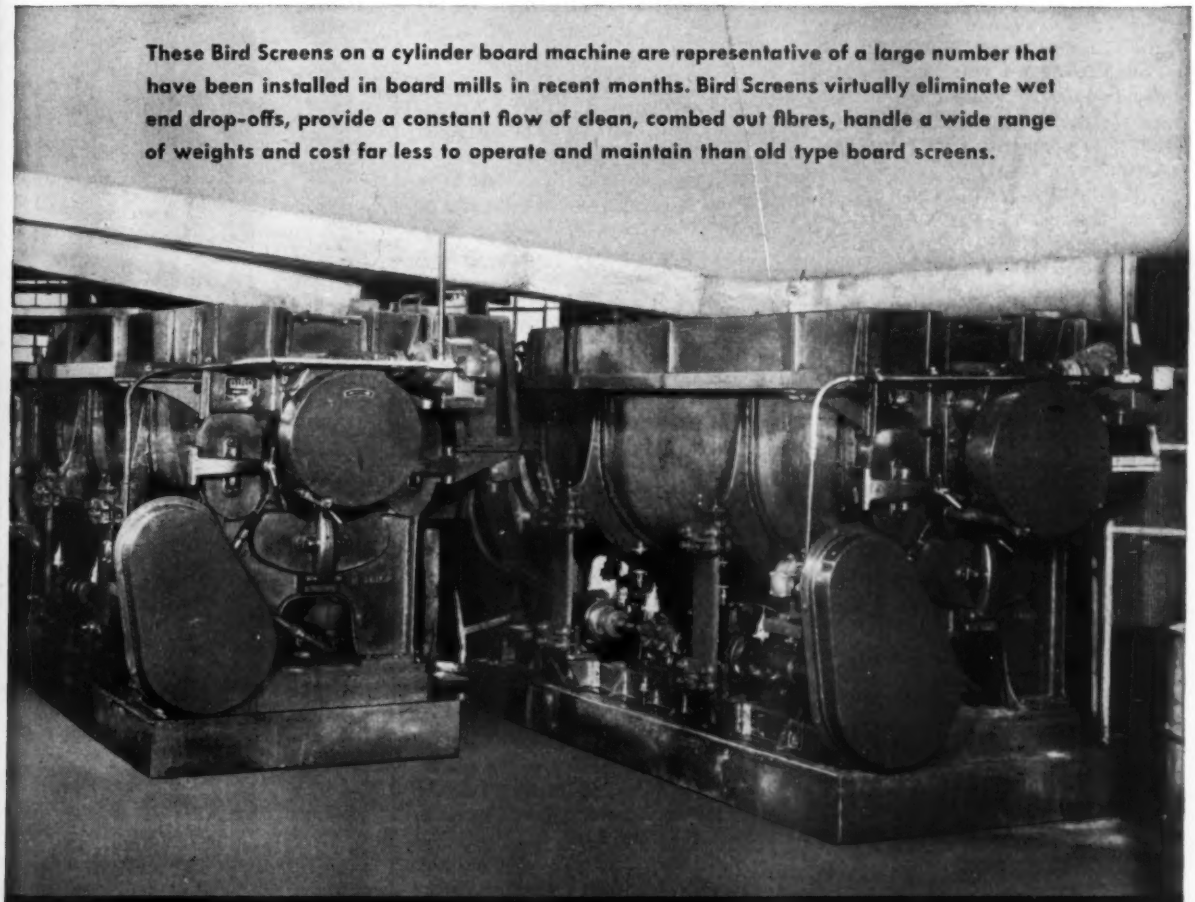
SWENSON
REG. U. S. PAT. OFF.
SWENSON EVAPORATOR COMPANY
DIVISION OF WHITING CORPORATION
15653 Lathrop Ave. Harvey, Illinois
ARDMORE (Phila.): 9 Rittenhouse Pl. HOUSTON 2: 825 M & M Bldg.
BIRMINGHAM 3: American Life Bldg. PITTSBURGH 22: 214 Empire Bldg.
BUFFALO 2: 610 Jackson Bldg. NEW YORK 7: 30 Church St.
CINCINNATI 2: 729 Fed. Res. Bank Bldg. SEATTLE 1: 1326 Fifth Ave.
TORONTO 9: 185 Eileen Ave.

100,000,000
POUNDS OF PAPER PER DAY

are screened by

BIRD SCREENS

in order to assure continuous production of uniformly clean, well formed paper at maximum machine speed



These Bird Screens on a cylinder board machine are representative of a large number that have been installed in board mills in recent months. Bird Screens virtually eliminate wet end drop-offs, provide a constant flow of clean, combed out fibres, handle a wide range of weights and cost far less to operate and maintain than old type board screens.

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

vestors hesitated to accumulate securities in view of the uncertainties due to the world situation, political possibilities, and the steel company seizure by the President's order.

Net Incomes

American Writing Paper Corp.—Net income for the first quarter was $88,295, as compared with $202,885 a year ago.

A. P. W. Products Co.—Net profit for 1951 was $3,633, as compared with $162,175 in 1950.

Celanese Corp. of America—Net income of $944,569 for the March quarter, compared with $9,429,196 for the same three-month period of 1951.

Certain-teed Products Corp.—Net income for the first quarter was $608,809, as compared with $1,221,056 in 1951.

Eastern Corp.—Net earnings for the first quarter were $350,225, as compared with $535,675 a year ago.

Fort Wayne Corrugated Paper Co.—Net profit for the March quarter was $251,529, compared with $483,499 a year ago.

Gaylord Container Corp.—Net first quarter income was $1,945,642, as against $2,107,061 a year ago.

Great Northern Paper Co.—Net income for the March quarter was $1,141,573, as compared with $1,304,750 last year.

Hammermill Paper Co.—Net income for the first quarter was $380,746, as compared with $449,312 a year ago.

Hinde & Dauch Paper Co.—First quarter earnings dropped to $754,485 from $1,126,362 in 1951.

Hollingsworth & Whitney Co.—Net income for the quarter ended March 31 was $811,257, compared with $748,565 in the same quarter last year.

International Paper Co.—Despite a record peak of sales twelve million dollars above the sales in the first quarter of 1951, net income fell to $12,746,594 from the 1951 first quarter of $14,263,516.

Lily-Tulip Cup Corp.—First quarter net income was $505,919, as against $835,676 a year ago.

Marathon Corp.—Net earnings for the first quarter ended January 31 were $1,905,081, compared to $1,903,574 in the same period last year.

Minnesota & Ontario Paper Co.—Net income for the March quarter was $1,193,503, as compared with $1,482,067 in 1951.

National Container Corp. — First quarter net income was $1,095,549, as against $2,928,381 a year ago.

National Vulcanized Fibre Co.—Net income for the first quarter was $247,420, as compared with $535,014 a year ago.

Nekoosa-Edwards Paper Co.—Net profit for the March quarter was $487,103, as compared with $580,059 a year ago.

Oswego Falls Corp.—Net first quarter income was $128,145, as compared with $418,721 in 1951.

Oxford Paper Co.—Net income for three months ended March 31 was $714,078, as compared with $707,164 for the same months in 1951.

Puget Sound Pulp & Timber Co.—Net first quarter income was $725,529, as compared with $1,062,233 a year ago.

Rayonier, Inc.—Net income for the March quarter was $2,928,698, as against $2,856,841 a year ago.

Rhinelander Paper Co.—Net profit for six months ended March 31 was $748,224, as compared with $720,976 for the comparable period a year ago.

Riegel Paper Corp.—Net income for 1951 was $1,231,470, compared with $1,817,416 in 1950.

St. Lawrence Corp., Ltd.—Net income for the first quarter of 1952 was $1,814,029, compared with $1,863,437 for the first three months last year.

Scott Paper Co.—Net income for the first quarter was $2,527,327, as compared with $2,668,460 in 1951.

Southland Paper Mills Inc.—Net income for 1951 was $2,893,174, compared to 3,542,682 in 1950.

Union Bag & Paper Co.—Net 1951 income was $12,217,685, as compared to $10,897,604 in 1950.

United Board & Carton Corp.—Net income for 36 weeks ended February 2 was $644,399, as compared with $561,624 for the comparable period a year ago.

U. S. Gypsum Co.—Net income for 1951 was $19,820,261, compared with $27,258,518 in 1950.

Weyerhaeuser Timber Co.—Net income for 1951 was $39,945,708, as compared with $32,908,595 in 1950.

Whitaker Paper Co.—Net income for 1951 was $750,475, compared with a net profit of $1,064,744 in 1950.

Dividend declarations

Champion Paper & Fibre Co. declared the regular quarterly dividend of 37½ cents a share on the common stock, payable June 1 to stockholders of record May 9. Also declared was the regular quarterly dividend of $1.12½ on the preferred stock, payable June 1 to stockholders of record June 12.

Crown Zellerbach Corp. has declared a quarterly dividend of 75 cents a share on common stock, payable July 1 to stock of record June 13, and a quarterly of $1.05 on the $4.20 preferred stock, payable June 2 to record May 13.

Fibreboard Products, Inc. has authorized the regular quarterly dividend of

APPLETON SUPER-CALENDER ROLLS . . .

First Choice for Fine Finishes!

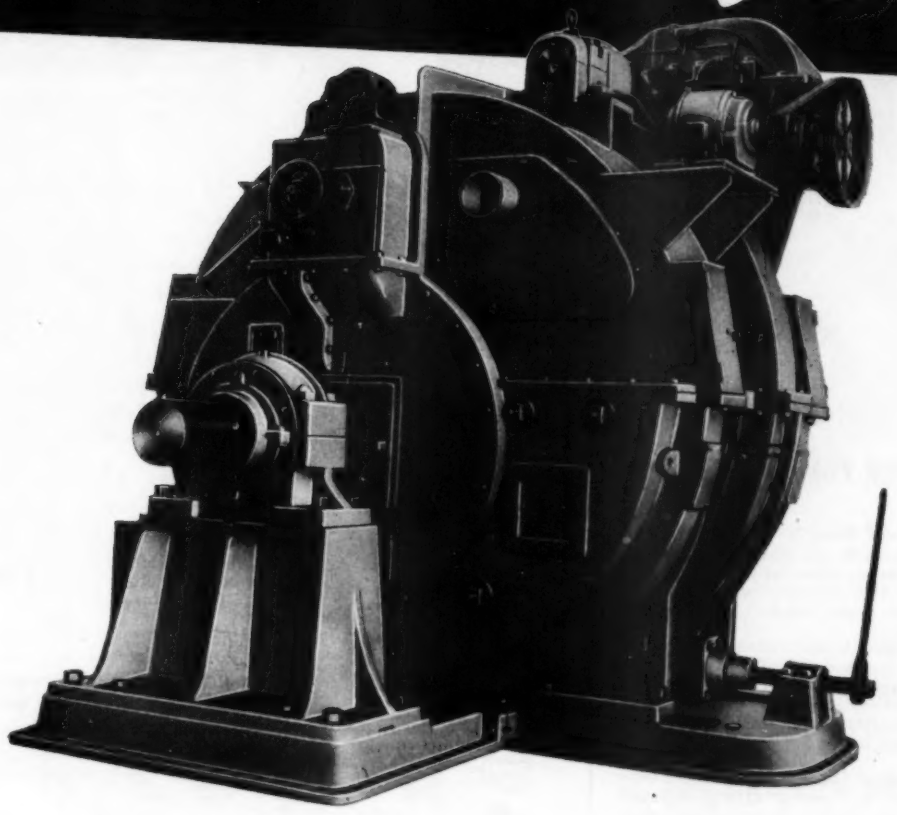
Appleton builds America's finest finishing rolls — available in a complete range of sizes and fillings to meet every finishing requirement.

THE APPLETON MACHINE CO.
APPLETON, WISCONSIN

Eastern Sales Representatives
CASTLE & OVERTON, INC.
630 Fifth Avenue, New York

Western Sales Representatives
PACIFIC COAST SUPPLY CO.
San Francisco • Portland

Reduce Your Labor Costs 70%

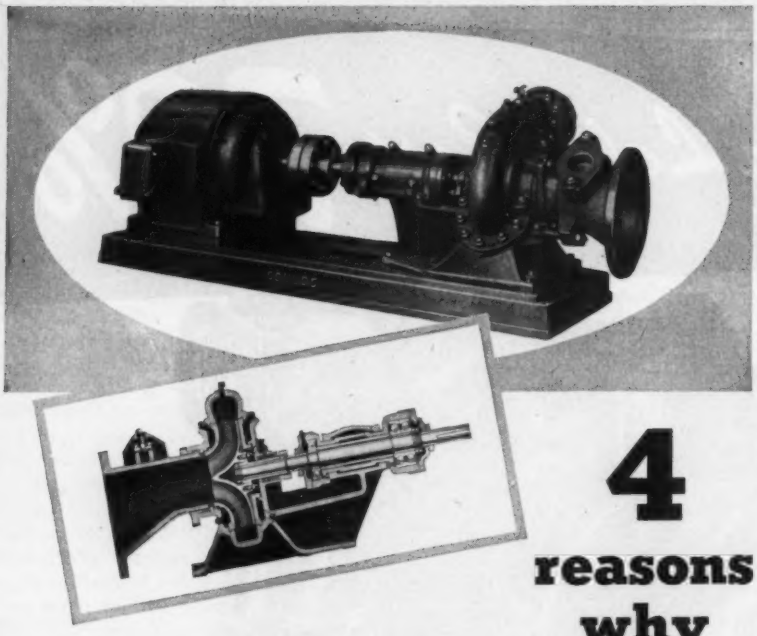


Another famous *Appleton Machine Company* product, this outstanding modern grinder designed for all grades of groundwood pulp, can cut your operating labor costs up to 70 per cent!

The Roberts Pulpwood Grinder is a continuous, high-speed ring-type machine that replaces 3 or 4-pocket units with resulting economy. High caliber operating means lower cost pulp with less waste. Don't let inefficient, out-of-date equipment eat up your profit margin!

The Roberts Pulpwood Grinder's many operating advantages are outlined in detail in a free bulletin that you can have today. Write now for complete details on this machine and the *Appleton Machine Company's* complete line of paper-making equipment.

CUSTOM-BUILDERS OF PULP & PAPER MILL MACHINES • WINDERS • ROBERTS GRINDERS • FINISHING ROLLS • REWINDERS



4 reasons why

GOULDS STOCK PUMPS REDUCE STOCK HANDLING HEADACHES

1. ***Positive even flow.*** **The inlet tips of impeller vanes are warped to give a screw conveyor effect which insures an even flow and prevents water separation of the paper stock.**

2. ***No jamming.*** **Ejector vanes follow curvature of main vanes of impeller, preventing entrance and jamming of stock or other solid material between back impeller wall and stationary wearing plate.**

3. ***Easy to adjust for wear.*** **Shaft and impeller can be moved axially toward suction side plate to take up wear due to abrasives in material handled.**

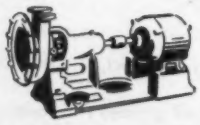
4. ***Easy to inspect and maintain.*** **You can inspect or renew rotating element without disturbing bearing assembly. Ample washout connections at top and bottom of casing. Stuffing box readily accessible and stuffing box gland easily removable.**

Goulds centrifugal stock pumps are especially designed for efficient handling of paper stock of all kinds and consistencies in mills of all types.

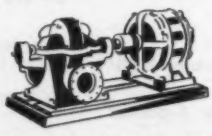
The heavy duty unit (Fig. 3105) illustrated above will deliver up to 4000 G.P.M. Heads up to 220 ft. Available in 4″, 6″, and 8″ sizes. For detailed information, complete specifications, write for Bulletin 723.1.

Other GOULDS PUMPS for Pulp and Paper Mills

This rugged vertical centrifugal stock pump (3115) requires minimum floor space. Available in capacities 150 to 2000 G.P.M. Heads up to 180 ft.



Stainless steel pump for handling acid and alkaline liquors. Capacities up to 600 G.P.M. Heads up to 160 ft. (3705).



For capacities up to 15,000 G.P.M. Heads up to 500 ft. Check the specifications of this Goulds ball bearing double suction centrifugal (3450).

MEMBER

Goulds PUMPS INC.
Seneca Falls
New York

$1.50 a share on the prior-preferred stock, payable May 1 to stockholders of record April 15.

Fort Wayne Corrugated Paper Co. has voted a dividend of 50 cents a share on the common stock, payable March 14.

Fox Paper Co. has declared a quarterly dividend of 50 cents a share on common stock, payable March 14 to holders of record March 8.

Gair, Robert, Co., Inc. has declared a quarterly dividend of 30 cents per share on the common stock and a dividend of 30 cents per share on the preferred stock, both payable June 10 to stockholders of record May 20.

Hollingsworth & Whitney Co. has declared a dividend of 62½ cents a share on common stock, payable June 12 to stockholders of record May 28, and a regular quarterly dividend of $1 per share on the $4 cumulative preferred stock, payable July 1 to holders of record June 13.

International Paper Co. has declared the regular quarterly dividends of $1 per share on the cumulative $4 preferred stock and 75 cents per share on the common stock. Both dividends are payable June 23 to holders of record May 29.

Lily-Tulip Cup Corp. has declared a dividend of 62½ cents per common share to stockholders of record June 2, payable June 16.

Marathon Corp. has declared a quarterly dividend of 30 cents a share on the common stock, payable May 31 to stockholders of record May 10. Also declared was a regular quarterly dividend of $1.25 a share on the preferred stock, payable July 1 to stockholders of record June 20.

Mead Corp. has declared the quarterly dividend of 40 cents on the common shares, payable June 1 to stockholders of record May 9. The regular quarterly dividend of $1.06¼ was declared on the 4½ per cent preferred, also payable June 1 to holders of record May 9.

Nekoosa-Edwards Paper Co. has declared a regular quarterly dividend of 40 cents, payable June 6 to stockholders of record May 29.

Puget Sound Pulp & Timber Co. has declared a quarterly dividend of 50 cents a share on the common stock, payable March 31 to stockholders of record March 7.

Rhinelander Paper Co. will pay a 40 cent regular dividend on April 1 to holders of record March 20.

Scott Paper Co. has declared a quarterly dividend of 60 cents per share on the common shares, payable June 12 to shareholders of record May 29. Also declared was the regular quarterly dividend of 85 cents per share on the $3.40 cumulative preferred shares and the regular quarterly dividend of $1 per share

Let's give them a sales plus in COLOR

Notice how colored wrappings liven things up around a store . . . how they establish identification and give free advertising when they're carried *out* of the store! Sell this forceful idea to your prospects and you'll win steady customers for your papers for wrappings, boxes, bags and gummed tape.

Du Pont is well set up to help you. First, we're aiming an advertising campaign to the stores; we're giving top billing to this important thought:

"When the package tells them where people are buying . . . it's COLOR that does the talking!"

And then, we're offering a technical service that will help you select the dyes that suit any kind of business personality, any specific need. For more information, write E. I. du Pont de Nemours & Co. (Inc.), Dyes and Chemicals Division, Wilmington 98, Delaware.

More color makes more business . . . for your customers and you

FOR MAXIMUM ECONOMY
Du Pont basic dyes

FOR MAXIMUM SOLUBILITY
Du Pont acid dyes

FOR MAXIMUM LIGHT FASTNESS
Du Pont dispersed organic pigments:

Monastral Fast Blues*
Monastral Fast Greens*
Lithosol Pigments*

*REG. U. S. PAT. OFF.

Du Pont Dyestuffs
DU PONT
REG. U. S. PAT. OFF.
150th Anniversary
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

on the company's outstanding $4 cumulative preferred shares, both payable August 1 to shareholders of record July 17.

Seaboard Container Corp. has declared a dividend of 12½ cents a share on Class A common stock, payable June 27 to stockholders of record June 16.

Southern Advance Bag and Paper Co. has voted an extra of 12½ cents and the regular quarterly dividend of 25 cents, both payable March 28 to stock of record March 14.

Whitaker Paper Co. has declared a dividend of 25 cents a share of common stock, payable July 1 to stockholders of record June 13.

Paper mill corporate changes

E. B. Eddy Co. is making a public offering of an issue of $4.8 million first mortgage sinking fund 4¾ per cent bonds, series "C," at $100 and accrued interest through a syndicate headed by Wood, Gundy & Co. Bonds will be dated May 1, 1952 and mature May 1, 1969.

Gaylord Container Corp. common stock is being distributed by Blyth and Co., Inc., at a price of $30 per share. This secondary distribution involves 9,000 shares.

Hammermill Paper Co. has filed a registration statement for the proposed sale of 200,000 shares of common stock, worth about $3,600,000 at current prices, to finance the utilization of a new process for the use of domestic hardwoods in the production of pulp for fine papers. After years of research the company is ready to embark on a conversion of the present Erie, Pa., mill to the use of the new pulp, and the balance of funds raised by the stock issue will be added to working capital.

Mississquoi Corp. common stock will be exchanged for convertible preference and common stock of the Standard Cap & Seal Corp.

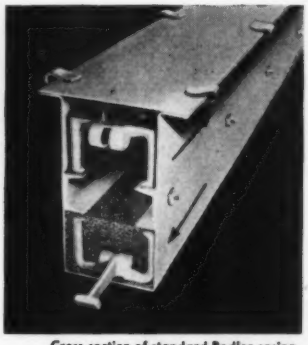
Scott Paper Co. stockholders recently voted to increase the authorized common shares of the company to 5,000,000 from 3,000,000 and the authorized indebtedness to $25,000,000.

Sonoco Products Co.'s increase of capital by the issuance of 150,000 shares of common stock has been completed by the offering of rights to purchase the new stock at $16.50 per share to stockholders at a ratio of one new share to four previously held. Unsold stock will be marketed through a New York financial group.

Sorg Paper Co., as a 100th anniversary bonus, has issued 3,000 shares of stock, valued at about $60,000, plus $12,000 in cash, to all employees of the company.

Unique conveyor moves wood chips at lowest cost per ton

Standard U-type Redler conveying element, or "flight", which moves through casings in an endless chain —no dragging or scraping action.



Cross-section of standard Redler casing. This shows material moving in lower run and flights returning in circuit fashion in the upper run.

REDLER

Conveyor Elevators . . .

S-A REDLER vertical closed-circuit conveyor elevator encircles storage silo . . . stores and reclaims wood chips for delivery to digester located in adjacent building.

REDLERS convey and elevate wood chips *in the mass*—horizontally, vertically, on incline or around bend corners. Skeleton-type links buried in the flow of wood chips keep them moving as a solid column. Continuous Conveying action takes place within a totally-enclosed, dust-tight casing.

Compact REDLERS are smaller in cross section than other types of conveyors of the same capacity. They handle large tonnage in limited space. Standarized construction, economy of installation and other features contribute to low first cost . . . and maintenance, too, is less.

Ask for Catalog 140 and full details.

1901-1951

50 years experience with bulk handling

STEPHEN S-A ADAMSON MFG. CO.

59 Ridgeway Avenue, Aurora, Illinois · Los Angeles, Calif. · Belleville, Ontario

DESIGNERS AND MANUFACTURERS OF ALL TYPES OF BULK MATERIALS HANDLING EQUIPMENT

New York Exchange—Stocks

	Closing Prices May 20, 1952	April 21, 1952
A.P.W. Products	5¼	* 5¾–5⅞
Celotex	18⅜	19
Same Preferred	* 16⅝–17	* 16⅝–16½
Certain-teed Products	15⅛	16¼
Champion P. & F. Co.	24⅝	25¼
Same Preferred	*103⅝–104	103⅝
Chesapeake Corp.	* 28⅛–28¾	* 32–32½
Continental Diamond	13	13
Container Corp.	32⅝	33¾
Same Preferred	*102–103	*102–103½
Crown Zellerbach	51⅝	54
Same Preferred	101⅝	102
Dixie Cup	32½	33¼
Eastern Corp.	21¼	21½
Robert Gair	15½	13⅝
Same Preferred	* 19½–20	19¾
Gaylord Container	29¼	29
International Paper	46½	44¾
Same Preferred	*103⅝–104½	*102½–104½
Kimberly-Clark	44¼	42⅝
MacAndrews & Forbes	42⅝	
Marathon	23⅝	24½
Masonite	29	29½
Mead Corp.	23¼	24¼
Same Preferred	* 92–93	* 92–92½
National Container	10⅝	12¼
Rayonier, Inc.	28⅜	27⅞
Same Preferred	35¾	* 36½–37
Scott Paper	50½	50⅝
Same $3.40 Preferred	91	94
Same $4 Preferred	*102½–106	*102¼–105
St. Regis	19⅝	22⅞
Same Preferred	* 94½–95½	* 92½–93½
Sutherland Paper	23¼	* 23–23¾
Same Preferred	*104½–105	*106½–106¾
Union Bag & Paper	45⅝	47¼
United Board & Carton	* 15–15¼	* 14⅝–15⅛
United Wall Paper	* 2⅞–3	3⅛
Same Preferred	* 24⅝–25	24¼
U.S. Gypsum	112⅝	110½
Same Preferred	177	*173½–175
West Virginia P. & P. Co.	* 74–75	74
Same Preferred	108	*107⅝–108

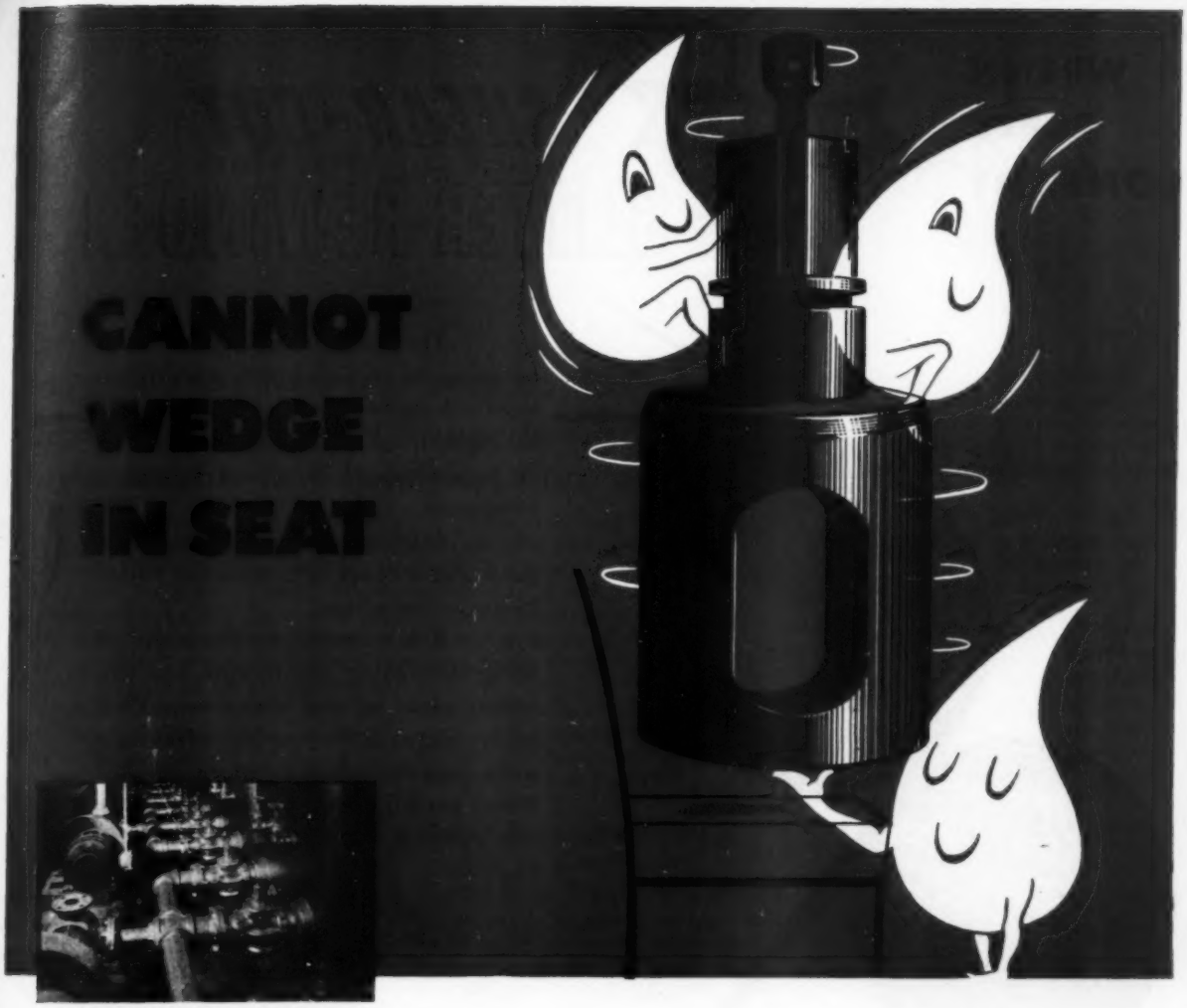
New York Stock Exchange—Bonds

Celotex 3¼%	99⅝	.....
Champion P. & F. Co. 3%	.....	.....
Mead Corp. 3%	.....	.....

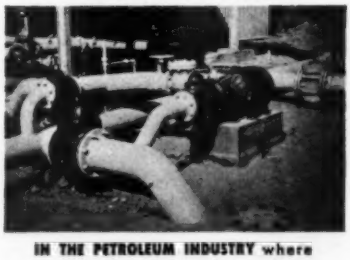
New York Curb Exchange—Stocks

Am. Writing	.....	.....
Brown Co.	11	12
Same Preferred $5	.....	105
Same Preferred $3	.....	48
Great Northern	54	58½
Hammermill	18¾	.....
Puget Sound	27½	33½

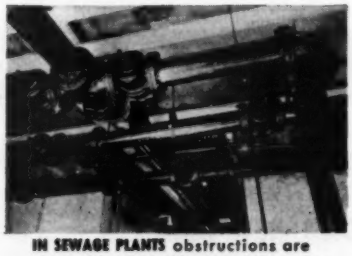
*Closing Bid and Asked Prices



IN CHEMICAL PLANTS a.c.f. "full pipe area" valves offer no obstruction... full flow for abrasives, suspensions.



IN THE PETROLEUM INDUSTRY where seconds count in loading and unloading a.c.f. Valves give fastest possible flow.



IN SEWAGE PLANTS obstructions are sheared by the knife-edge action of the a.c.f. CYLINDRICAL Plug.

a.c.f. CYLINDRICAL Lubricated Plug Valves have no wedging effect. This plus the quick, quarter-turn shut-off feature gives you safe, sure, split-second control even at capacity flow. Made to last, a.c.f. Valve bearing surfaces are lubricant sealed. Substantial reasons for the absolute leadership of Full Pipe Area a.c.f. Valves.

a.c.f. CYLINDRICAL FULL PIPE AREA PLUG VALVES

Write for Catalogue 4-PI, American Car and Foundry Co., Valve Division, 1501 E. Ferry Ave., Detroit 11, Mich.

Representatives in 50 Principal Cities

WRENN PAPER COMPANY

SELECTS B&S

SHEAR-CUT SLITTER-REWINDER

The Wrenn Paper Company, widely recognized for its high quality products, was faced with the problem of slitting a hard-to-handle material. Clean, square edges and uniformly wound rolls were of utmost importance.

After considering several machines, the Bagley & Sewall #15 Shear-Cut Slitter-Rewinder was selected.

B & S Slitters and Rewinders are doing outstanding jobs in mills and converting plants all over the country. Their many unique money-saving advantages make them the first choice of the industry. Before you buy, *compare*...and your choice, too, will be B & S Slitting and Rewinding equipment.

For full details write to The Bagley & Sewall Company, Watertown, New York.

Inserts show Shear-Cut Slitter Units

BAGLEY & SEWALL

designers and builders of **PAPERMAKING MACHINERY**

SINCE 1853

WATERTOWN, NEW YORK

Foreign Representative: CASTLE & OVERTON, INC., 630 Fifth Avenue, New York 20, N. Y.

News of the Industry

British Columbia "land rush" on as . . .

Canadian Pulp and Paper Industry Investments in Expansion Continue

At present there are 24 companies in British Columbia in the same stage of applying for forest management licenses. Twelve applications have been given final approval and cover 2,300,000 acres. Columbia Cellulose Ltd., a subsidiary of Celanese Corp. of America, holds license No. 1. Celgar Development Co. is another subsidiary of Celanese and has applied for a license covering 3,000,000 acres north of the Columbia River from Castlegar. The firm plans an integrated operation, manufacturing newsprint, hardboard, plywood and pulp, with an approximate investment of $65,000,000.

With the granting of an application, the operator does not own the land but uses the timber and pays a stumpage rate to the province.

Celgar officials recently arranged a conference in Victoria between B. C. Forest Service officials and 18 small logging operators from the Revelstoke area. The majority of the small operators expressed approval of the Celgar development. Chief complaint is that most of the timber set aside for small firms is difficult to reach and not near present holdings; moving to other areas would entail the construction of expensive roads.

Gordon Root, director of public relations for Celgar, stated that the company could not obtain the pulpwood necessary for operation of the new plant unless the small operators were kept in business by giving them a reasonable deal. He said that Celgar has no intention of cutting out the small operators. He further declared that the establishment of Columbia Cellulose at Prince Rupert had benefitted the small operators by giving them a market for pulpwood formerly wasted or not marketable.

Loggers and businessmen in the Castlegar area will support the license if forest development operations are begun by the company within one year of license approval and if the operations continue until its pulp mill is in full production. Celgar does not expect to undertake much work on the mill for two years because of the steel shortage. Rumors have also been heard that the firm has considered delaying the whole project because of market conditions. These rumors, however, appear to be unfounded.

Assurance has been given by Mr. Root that there will be no pollution of waters from the proposed mill. He stated that the firm had dropped the plan to build a sulphate mill at Castlegar.

Foley Sees Integration as Key to Continued Growth in Western Canada

Continuing expansion in the forest industries of western Canada as the result of increased integration of operations was forecast recently by Harold S. Foley, vice chairman of the executive board of the Canadian Pulp and Paper Association. Mr. Foley addressed a meeting of the Technical Section of the CPPA's Western Division.

"New conditions in the forest industry," he declared, "present a challenge for both management and technical people. There is much yet to be done—the use of our waste materials has not been fully studied, though considerable progress has been made. We must find how to use sawmill and forest waste more economically; we must find other products which it will provide.

"Twenty-one years ago the total production of the pulp and paper industry in British Columbia amounted to 331,000 tons with a market value of $23,000,000. Last year's total tonnage was 963,000, which sold for $116,000,000. Twenty-one years ago 64 per cent of B. C.'s pulp and paper production was newsprint; 36 per cent was pulp. Last year these percentages were reversed.

"In other words, in addition to a large increase in newsprint there has been an even more impressive growth in pulp, especially sulphate, which in 1952 will account for nearly one-third of our total production. The sulphate process is particularly suited to the utilization of forest and sawmill wastes, 90 per cent of its raw material coming from this source this year."

Speaking of the Ladysmith Experiment of 1943 and 1944 (a re-logging or wood salvaging project undertaken by the Comox Logging & Railway Co. and Powell River Co. in cooperation with the provincial forest service), Mr. Foley explained that it was a deliberate effort to find ways and means of recovering left-over wood after logging. "It was a planned approach to more complete forest utilization," he said, "and an attempt to establish salvage wood recovery and handling techniques. And, finally, it was an experiment to see if the processing of salvage wood into pulp was economically possible.

"In the short period since then (the Ladysmith Experiment) we have witnessed the rapid trend toward *complete* utilization. In addition to finding methods of using logging salvage, the industry has moved on to the use of sawmill waste.

"Complete utilization of the forest crop leads naturally to integration of forest industry—a situation where the logging camp, the sawmill, and the pulp and paper mill are complimentary to one another. They are units in a chain of economic usage of the forest. This

NEWS HIGHLIGHTS

Canadian Developments.....319
Forestry Report.....321
Newsprint Supply Eases.....325
Appleton Institute Meeting.....329
Mill Expansion Plans.....332
Mando Changes to Lignite.....336
Stream Pollution Report.....338
Production Report.....348

leads to diversification in a firm or group of firms working together to make the best possible use of those natural resources which are its raw material.

Paper Industry a Stimulus

"The pulp and paper industry on the Pacific Coast, and particularly in B. C., has provided much of the stimulus for this trend toward complete utilization and the consequent integration of forest units. A number of factors helped the pulp and paper industry to assume this leadership—a combination of economic conditions forced log and mill costs to new highs so that small wood became more valuable than ever before. The market was good, and there was a demand for every ton of pulp.

"This signal performance in the field of close utilization has been made possible by: (1) the integration of logging, sawmills, and pulp mills; (2) the coordination of the skills of management, foresters, and technical executives; (3) the whole-hearted and active support of the British Columbia Forestry Branch under the direction of the Hon. Mr. Kenney and Dr. Orchard, and (4) the alertness of manufacturers to foresee the potentials and develop equipment essential to the economic handling of sawmill waste and logging salvage."

C. N. R. Branch to Serve Kitimat

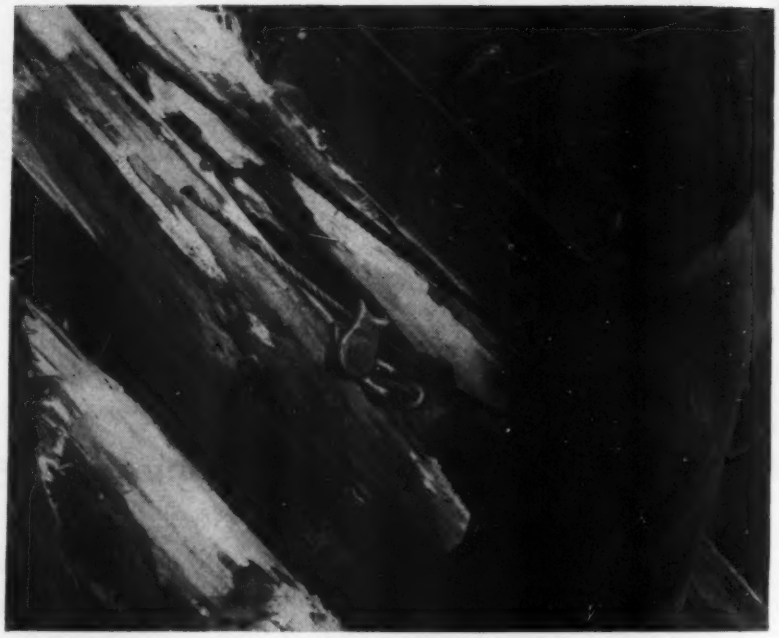
Canadian National Railways is planning to construct a branch line to the Aluminum Co. of Canada at Kitimat. Terrace, 96 miles east of Prince Rupert, B.C., will be the junction point. According to a spokesman for the C.N.R., negotiations are to begin soon with the provincial government for a combined railway and highway bridge to be constructed at Terrace.

The railway has expressed the belief that the new branch will become one of its most important lines, and that Prince Rupert will be an important seaport in the future. No definite reports have been heard with regard to Powell River Co.'s plans for the construction of a pulp mill at Kitimat. However, it is thought that the issue is still alive.

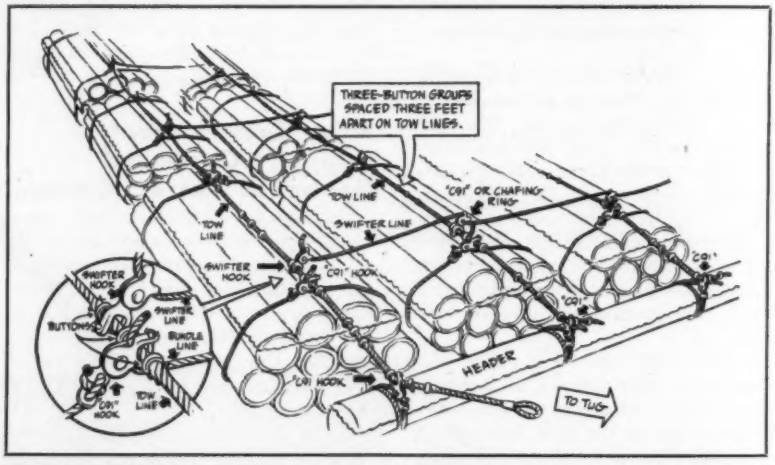
European Firms Interested in Manitoba Pulp

Manitoba's northlands may be opened up for the exportation of pulpwood from Port Churchill to Switzerland and France. This was revealed recently by Dr. Alfred Huber, representative of four Swiss and French firms. He said that the undertaking has never been tried before, and that a trial shipment of about 2,000 cords (one shipload) will probably be tested this year.

France and Switzerland now import about 50,000 cords of pulp from eastern Canada. Using the northern port would supplement this quantity, as well as create a market for wood which would not otherwise be utilized. The only disadvantage seen in the plan are the high freight rates that would be incurred, as the timberlands nearest to Port Churchill are served only through a 400-mile rail haul. If this can be overcome, the plan might prove more feasible.



MEIGHAN HOOK has facilitated greatly the bundling of re-logging and salvage material; insurance costs and sinker losses are substantially reduced



METHOD EMPLOYED with the new-type hook to tow large numbers of bundles; lines are used for swifters, and the header keeps the bundles separated

New Bundling Method Used in British Columbia

Operators along the west coast of British Columbia are finding it necessary to employ new bundling techniques to make use of the small logs that are being utilized from relogged and burned-over areas. At the present time several small operators on Vancouver Island are bundling small logs from areas around Central Lake and towing them to the Bloedel operations at Port Alberni.

The recently introduced Meighan C-9 Hook has been an influencing factor in facilitating the bundling. The hook, developed by Bill Meighan of Portland, Ore., gives the advantages of eliminating the sinking of logs, of saving storage space, and of increasing the ease of towing. Under normal operations, about 5 per cent of the logs are lost as sinkers. The hook reduces insurance charges in Canada by 50 per cent.

No splicing is necessary for the ⅜-inch or ⅝-inch wire rope that is used,

wear and tear on the rope does not appear to be a great cost factor. Ropes are often used as many as 15 or 16 times.

Tension is applied to tighten the sling around the bundle, and the rope slides through the eye. When tension is released, the hook takes hold of the cable, and release is then brought about by knocking out the lock pin on which the eye pivots.

Also used is an attachment or booster to enable bundles to be drawn extra tight when they are to be put through rough waters. When the tightening is finished, the booster may be used on the next bundle.

Much good timber along the British Columbia Coast is not now being used because of poor facilities for getting the logs to the mills. However, with further improvements in handling by bundles, towing may be easier in the ocean, thus opening up these previously inaccessible areas.

New B. C. Forest Division

The Working Plans Division, an entirely new branch, has been added to the British Columbia Forest Service, according to an aunnouncement by E. T. Kenney, minister of lands and forests. The division is to be headed by Forester W. G. Hughes.

Increasing interest in utilization on the part of industry in British Columbia and increased use of sustained yield management of forests has deemed the new division necessary. The branch will give complete technical attention to applications for forest management licenses, farm woodlots, tree farm land certification, and the establishment of public working circles.

Westminster Paper Co.
has definitely confirmed that it will build a $25,000,000 bleached sulphate pulp mill in the Prince George area of British Columbia. The capacity of the operation will be 300 tons a day.

St. Lawrence Co.
expects 1952 profits to be hit "by a serious drop in the demand for pulps" and by the loss of exchange benefits due to the upward valuation of Canadian currency. This was the view expressed by P. M. Fox, St. Lawrence president, as he addressed the annual meeting recently. On the other hand, he added, operations of the firm are expected to be at full capacity during the year—with the exception of pulps.

A $100,000 Fire
destroyed the storage warehouse of Provincial Paper Mill Co. in Thorold, Ont., April 26. The flames were halted before they reached adjoining buildings. Tons of bonded paper fed the fire.

Fire danger high as . . .

Forestry Activities Show Increase

United States Forest Service stations in many parts of the country are reporting an ever-increasing fire danger with the coming of dry summer months. In various sections below-average rainfalls have created unusually severe fire conditions. On May 27 fire believed started by the sparks of a passing freight locomotive destroyed 200 acres of timber and brush near Carlton, Minn. The first week in May was the worst in 10 years for forest fires in Michigan, according to the state conservation department. In that period fires, aided by dry woods and the lack of green vegetation, totaled 206 and destroyed 1,470 acres.

Thus far this year in Michigan alone 432 fires have damaged 3,245 acres. Last year, a record low, saw only 669 fires and 4,495 damaged acres for the entire season. Conservation field officers have been instructed to use extreme caution in issuing fire permits and have been authorized to refuse them in high hazard areas.

Air patrols have been established to supplement other forms of forest fire detection in the Escanaba district. The patrol is on duty daily from 10 a.m. to 7 p.m. Use of the plane has assisted ground forces in locating a fire quickly, surrounding it, and bringing it under control. In the district so far in 1952 there have been 45 fires over 203 acres. During 1951 there were 35 fires on 244 acres.

In Wyoming the Natural Resources Board plans to look into legislation necessary to get Clark-McNary Act forest fire protection for state and privately owned lands. According to John d'Amico, board secretary, 1,472,000 acres of state and private forests are unprotected. To set up the protection needed it will be necessary to form a protection agency that will qualify the state for participation in the Clark-McNary Act, based on state and private expenditures.

Canada Sets Up Protection

Ontario's Provincial Air Service, an air-borne fire department, has taken to the skies for its regular summer fire patrol. Some 40 planes are involved in the 400,000-square-mile task. Teamed with the air spotters are the rangers who man 300 fire towers in the area. The towers are linked with each other and with headquarters by a telephone and radio system.

TREE CROP FOR THE FUTURE—A Mando woodsman plants a row of tree seedlings; nearly 3,000,000 have been planted by the firm on unproductive lands

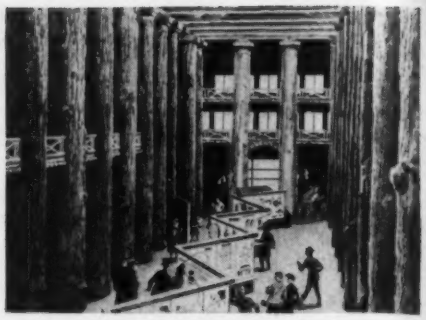
Mando Plants Quarter Million Seedlings

Minnesota & Ontario Paper Co. announced plans recently to plant this spring 250,000 seedlings in a 175-acre area near its International Falls, Minn., paper and insulation board mills. This is part of the firm's tree-planting program that calls for a quarter million plantings yearly. So far the project has resulted in the setting out of 3,000,000 seedlings on burnt-over, unproductive lands in northern Minnesota.

This year mechanical planters, tractor-pulled, two-man machines, are transplanting 250,000 Norway pine, jack pine, and white spruce. Many of the acres being planted were included in the sales of tax-forfeited timberlands.

Most of the 3,000,000 Mando plant-

MASSIVE LOG CABIN that will house Portland's permanent forest industry exhibit



ARTIST'S CONCEPTION of the cabin's interior as it will appear during the show

World's Largest Log Cabin to House Forest Products Show

The biggest permanent forest products exhibit in the world was to open its doors in Portland, Ore., in June. It is to be housed in the world's largest log cabin, the "Parthenon of the Forest." The structure, whose principal supports are 52 gigantic Douglas fir logs, was to be converted into a "Gallery of Trees," featuring three-dimensional exhibits of the modern western forest products industry.

Thirteen different segments of the forest products industry representing the entire Pacific Northwest have agreed to install modern exhibits at a total value of approximately $100,000.

Originally erected in 1905 as a part of the Lewis and Clark International Exposition, the vaulted "cabin" has been completely renovated and dramatically lighted. The building measures 206 by 102 feet and once housed displays of Oregon's fir, pine, hemlock, spruce and rare myrtlewood.

Funds for the renovation and modernization are being sought by the Committee of Rehabilitation of the Forestry Building Exhibits, Portland, headed by Marshall Dana, former edfitor of the *Oregon Journal*. He estimates that the complete job will cost approximately $15,000 and is asking the forest industries to contribute to the project.

---

ings on 2,000 acres in the past have proved successful. It is expected that these young trees will produce, during the next 40 to 50 years, at least 80,000 cords of wood. Tree plantings account for only a small portion of the amount of trees consumed yearly by the foresct product industries. But they are a vital part of industry's forest management program.

U.S.F.S. Reports Spruce Budworm Being Controlled

North America's most dangerous forest insect—the spruce budworm—is being successfully curbed in the Pacific Northwest, but the pest is threatening outbreaks in areas of Montana and Idaho and in Canada near the Maine border (see THE PAPER INDUSTRY for May 1952), according to a recent entomological report of the U.S. Department of Agriculture.

Three years of concerted effort by federal, state, and local organizations against the budworm in the Douglas fir and white fir forests of Washington and Oregon has cost approximately $2,300,000, but it has saved some $63,000,000 worth of timber as it stands in the forest. The survey report of the USDA's Bureau of Entomology and Plant Quarantine indicates that timely use of DDT during the past three years has reduced the area of heavy infestation from 887,000 acres in 1949 to 82,000 acres this year. Tree mortality has been confined to less than 10,000 acres. Airplane spraying of more than 2,000,000 acres in Washington and Oregon has been carried on since the intensive campaign was started. An additional 640,000 acres are to be treated this year, and in 1953 the control job on all areas should be finished.

Infestations in the spruce-fir types have declined naturally in the Northeast, but the heavy build-up of the same insect in the same forest types in New Brunswick and eastern Quebec makes the situation serious in those areas. Plans are being made to spray some 200,000 acres of threatened timberland in New Brunswick this year.

In Montana and Idaho more than 1,250,000 acres of Douglas fir are reported infested, and the budworm is threatening the principal Christmas tree-growing area of Montana, as well as sawtimber stands. Airplane spraying for about 37,000 acres has been recommended.

The jack pine form of the budworm reached epidemic proportions on nearly 1,500,000 acres in northern and central Michigan in 1951, and entomologists believe damage to jack pines is on the increase. Air spraying with DDT successfully controlled the insect on one 4,350-acre area in the northern part of the state.

Felled Logs Protected From Insect Attack

Many southern lumbermen are using the insecticide benzene hexachloride (BHC) to control insects attacking green hardwood and pine logs. The newly developed wood protection method is the result of recent research findings of entomologists of the U. S Department of Agriculture.

Use of BHC, forest users find, provides a way of protecting felled logs that cannot be immediately processed from the insect tunnelling (and resultant infection with decay organisms) that causes the sale price of much high quality lumber to be graded down.

Scientists of the USDA's Bureau of Entomology and Plant Quarantine have found that BHC not only prevents attacks of ambrosia beetles (pinhole borers), bark beetles, and wood borers—the major insects attacking green hardwood and pine logs—but also can be used to protect green lumber from damage by ambrosia beetles.

The entomologists recommend use of 1¾ pounds of the gamma isomer of BHC mixed in 50 gallons of No. 2 fuel oil and sprayed on the logs at the rate of 1 gallon of spray mixture for each 100 square feet of bark surface. It is imperative that all bark be completely wetted with the spray. Single logs can be sprayed effectively with a common knapsack type sprayer, but stacked logs require treatment with equipment capable of delivering spray at a pressure of 200 pounds per square inch.

For treating green lumber the entomologists recommend an emulsion of 5 ounces of the gamma isomer of BHC in 50 gallons of water. This BHC emulsion can be added directly to the vats containing fungicides, which mills normally use for dipping lumber to prevent sap stain.

The scientists are currently testing BHC wettable powder sprays to determine whether they are as good or better than oil sprays for use on logs. They

Modernization Pays

Profits from stepped-up production, better sheet quality and a wider range of paper products have paid for machine modernization programs in some of America's greatest mills.

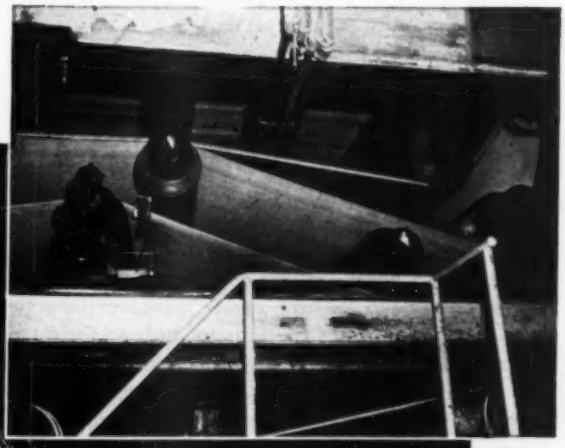
Modernization may mean the replacement of an obsolete drive, the addition of a new Wet End, a new Press Part, a new Size Press. It may call for the replacement of inefficient dryers. It might be the complete rebuilding of the machine itself.

As a typical example, Union Bag and Paper Corporation, Savannah, Ga., recently replaced all the low pressure 65 pound dryers (71 paper and 18 felt) in their No. 4 machine with new high-pressure 125 pound dryers. In a unique operation, their engineers, maintenance and operating crews made the change while the machine continued to turn out paper, by isolating each of the four dryer sections in turn, then bypassing that section in which the new dryers were being installed. The machine was stopped only long enough to disconnect the dryer section to be changed. About a week prior to each shut-down the bottom dryer felt on the particular section was removed and necessary work begun to permit bypassing the sheet.

If you are faced with high maintenance costs, if you require a greater range of high grade paper products – whatever your modernization problems may involve – get the benefits of Puseyjones experience. Call or write us today.

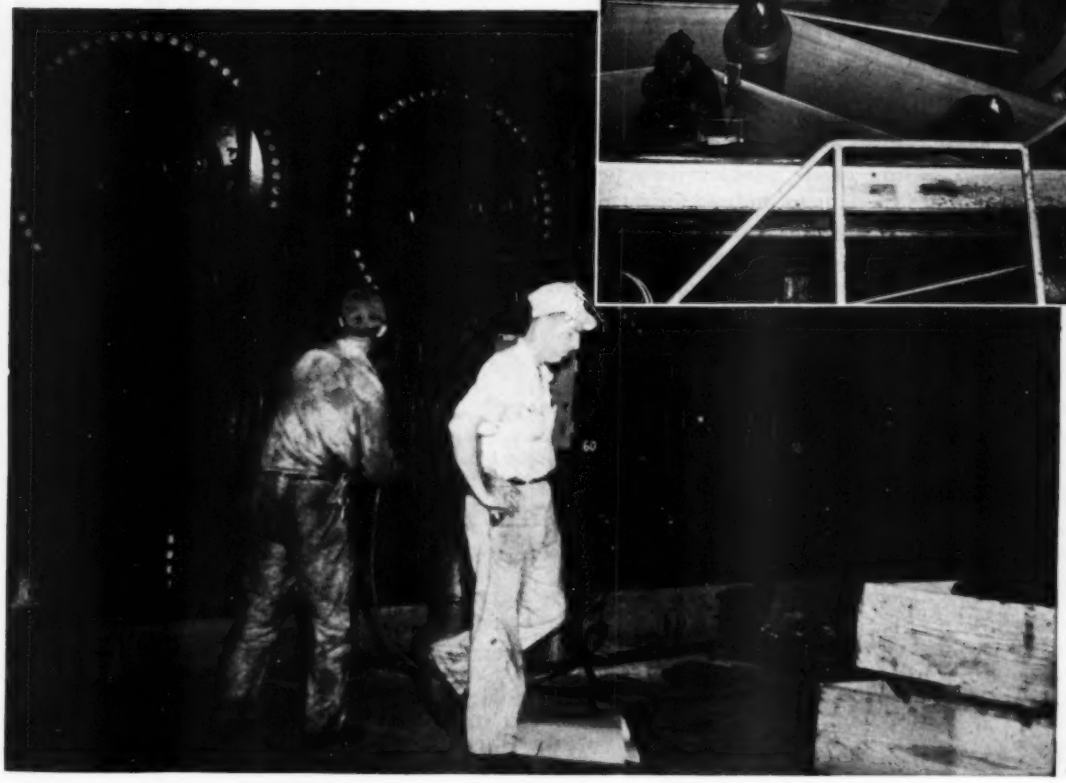
THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Fabricators and Welders of all classes of Steel and Alloy Products
Wilmington 99, Delaware, U.S.A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY



High-pressure dryers in place ready for installation of felts.

Basement run of paper when by-passing the isolated section and while new dryers being installed.



ACIDS • FUMES • ALKALIES • SOAPS • CORROSION • MILDEW • DECAY • STEAM • NOISE • OXIDATION • WEAR • ABRASION • RUST • CONDENSATION • HEAT • SOOT • WATER • SMOKE • SUN •

for Really Tough Applications...

TROPICAL

heavy-duty

MAINTENANCE PAINTS

SINCE 1883

THERE IS A TROPICAL *heavy-duty* PAINT FOR EVERY "PROBLEM JOB" YOU HAVE!

You don't have to resign yourself to frequent repeated painting on "problem" surfaces, using ordinary maintenance paints. In thousands of plants and buildings, for 69 years, Tropical *heavy-duty* maintenance paints have been solving these "problem jobs" effectively. Tropical fresh-mixed paints are specially formulated for the really tough applications. That's why they far outlast ordinary maintenance paints and endure where the service is severe! To select the right paint for the job, in the right quantity, and for correct method of application, use the expert service of the Tropical man in your community. Write us today!

Since 1883

HEAVY-DUTY MAINTENANCE PAINTS

TROPICAL®

SUBSIDIARY OF PARKER RUST PROOF COMPANY

MAKERS OF Bonderite QUALITY CORROSION-RESISTANT

Why do Many PAPER MILLS use Tropical?

. . . because the moisture, fumes and acids in paper mills quickly reveal paint qualities and they have proved that Tropical *heavy-duty* paints give performance far superior to ordinary maintenance paints. Extra durability calls for extra quality—*Tropical quality.*

FREE! Send for your copy of the "Industrial Paint Index"—a quick, convenient reference chart for a multitude of maintenance paint applications!

THE TROPICAL PAINT & OIL COMPANY, 1116-1288 West 70th St., Cleveland 2, Ohio

are also working on a log-dipping technique that will kill the ambrosia beetles already in the wood and are attempting to develop methods of fumigating logs with methyl bromide. Fumigation, they believe, would allow large-scale treatment of logs in railroad cars or in the holds of ships and would be economically important to importers of green lumber from tropical countries.

S. C. Industry Group Encourages Timber Growth

Formation of a statewide Forest Industry Committee to promote tree growing and improved timber protection in South Carolina was announced recently by J. E. McCaffrey of Georgetown. Mr. McCaffrey, associated with International Paper Co., is chairman of the group.

The 21-man organization, representing all types of wood-dependent firms, reports that plans are being made to help assure an adequate and permanent supply of trees for the state's economically important forest industries.

In reporting the formation of the committee, it was pointed out that after three centuries of constant use, South Carolina's forests continue to grow more wood than is used. However, forest fire losses, insect damage, and disease offset the favorable growth ratio. In addition to combatting the scourges of nature, the committee will drive for the improvement of woodland management practices by timberland owners.

In addition to Mr. McCaffrey, the pulp and paper industry is represented on the committee by James H. Graham of West Virginia Pulp & Paper Co., Charleston.

U.S.F.S. Praises Arkansas Forestry Program

Good management of southern pine forests in Arkansas is described in the latest findings of the forest survey of that state being conducted by the U.S.F.S. experiment station at New Orleans.

Cited as outstanding were the reforestation activities in seven south Arkansas counties, where pine saw-timber volume has increased by one-third since 1936. According to the survey, this increase is the result of more than two decades of rapidly improving forestry. As a contrast, in the 13-county region directly to the west, where good management was not started as early nor is as widely practiced, pine saw-timber volume has dropped almost one-fourth.

Pine saw-timber in the seven-county area now adds up to almost 6.2 billion board feet. This is 33 per cent more than the 4.6 billion of 1936, when the first survey was made. In terms of total pine growing stock, which includes pulpwood size trees as well as sawlog-size trees, the increase has been 17 per cent.

Nearly all the forest in the area is privately owned. It is estimated that almost half is held by large lumber and pulp companies, which employ professional foresters to manage their lands.

Forestry Notes

Prompt Salvage of Trees
infested with the southern pine beetle has been credited by USDA entomologists with bringing two major outbreaks of this insect pest under control in 1951. The concerted action of timber operations, coupled with the effects of the beetles' natural enemies, reduced the insect's status from that of a major southern forest danger to one of minor importance this year.

Four Southern States
have been removed from the list of states that are designated as noninfected with white pine blister rust, according to a USDA announcement. The states are Georgia, Kentucky, South Carolina, and Tennessee. Federal quarantine regulations are aimed at preventing the spread of the pest.

Insects and Disease
cause greater loss to timberlands than does fire. During the 10 years from 1934 to 1943, the U.S.F.S. reports, fire losses averaged 460,000,000 cubic feet of timber annually, compared with about 622,000,000 cubic feet destroyed by insects and disease.

Great Northern Paper Co.
has announced that its present conservation methods will insure a supply of pulpwood for at least a century. The firm owns 12 per cent of the total area of Maine, most of it in northern timberlands.

Weyerhaeuser Timber Co.
foresters at Eugene, Ore., have developed a method of using an ordinary power saw as a pump for fire fighting. Invented at the firm's Springfield Branch machine shop, the pump unit can be attached to a saw motor in one minute. A 7 hp saw with pump attached will throw two streams of water through 5/16-inch nozzles under 100-pound pressure.

More Timber-Access Roads
are needed in the Pacific Northwest, according to W. D. Hagenstein, forest engineer for Pacific Northwest Forest Industries. He recently told a Senate subcommittee that Congress should authorize $30,000,000 yearly for five years for such roads in national forests. He added that the lumber industry would construct many of the needed roads if the government would sell timber in larger blocks.

Nearly 500,000 Acres
of land in the United States were planted in trees during 1951. Privately-owned lands made up almost 80 per cent of the total. It brought the nation's total reforested area to 7,700,000 acres.

Six Yugoslav Officials
visited the Forest Products laboratory in Madison, Wis., recently. Heading the delegation was Gen. Sertovar Vukmanovic, minister of industry and second only to Marshal Tito.

Canada hikes price as . . .

Tight Newsprint Supply Situation is Seen Easing Appreciably

Canada was to hike the price of newsprint $10 a ton to $126 June 15. This price, the highest in 31 years, was said by the Canadian government to be necessary to offset the unfavorable dollar exchange. Shortly after the boost was announced, Ellis Arnall, director of the Office of Price Stabilization, lodged a strong protest with government officials in Ottawa. Newspaper published in the United States fear that the move will force their publications from "the black into the red."

The Canadian dollar is now worth about $1.01½ in terms of the U.S. dollar. Newsprint is now selling for $116 a ton delivered in New York, N.Y. According to *The Wall Street Journal*, Mr. Arnall has declared that he was informed by Canadians that in July 1951 the $116 in American funds yielded $123.40 in Canadian money to manufacturers, but today it brings only $113.50.

According to Canadian Trade Minister Howe, the $10 rise is the limit being permitted. He said that he did not think all firms would take advantage of the new ceiling, however. The price to Canadian publishers will not be changed.

In Montreal, Canadian newsprint producers announced the $10-a-ton increase to all foreign buyers. R. M. Fowler, president of the Canadian Newsprint Association, reported the move effective June 15. According to the *Journal*, there is actually no price control over Canadian newsprint. Under government emergency powers, however, a newsprint admin-

istration was created with power over prices. In this latest case the government simply stated that it will not interfere with the proposed increase and so informed the U.S.

A similar $10 boost in the price of Canadian newsprint last July created so much controversy that the Ottawa government finally agreed to consult with the U.S. before permitting any more such hikes.

Producer Justifies Hike

As reported in the *Journal*, John H. Hinman, president of International Paper Co., New York, N.Y., refused to comment on the price increase. Earlier in the month, however, he is reported to have said, "it is justified," basing his contention on the adverse Canadian dollar exchange. Mr. Hinman also pointed to higher labor costs and freight rates.

According to sources in Montreal, Canada's National Federation of Pulp and Paper Workers are seeking a 40-hour week and a 20-cent hourly wage increase. Involved in the negotiations, which are expected to be completed by late this month, are 14,000 newsprint mill workers..

Two of "Big Three" Make First Price Hike Move

Two of Canada's biggest newsprint producers announced May 20 that they would take advantage of the $10 price boost in mid-June. Consolidated Paper Corp. and Abitibi Power & Paper Co., the second and third largest manufacturers, notified U.S. customers that $126 a ton would be the New York price June 15. International Paper Co., leading Canadian producer, had made no move as of that date. The present Canadian price, $112 plus tax, is unchanged.

The increase will vary according to the section of the country, but the New York price will serve as a national basis. It will add approximately $50,000,000 a year to the costs of U.S. publishers. Newsprint accounts for as much as 50 per cent of the cost of getting out a large metropolitan daily, and since the end of World War II its price has advanced 152 per cent.

Publishers Forecast Newsprint Supply Balance for 1952

Members of the American Newspaper Publishers Association meeting recently in New York, N.Y., heard a report that the tight newsprint situation of a year ago has eased somewhat. According to the ANPA's committee on newsprint, members reporting consumption used 1,093,203 tons during the first quarter of 1952, an increase of 16,696 tons over the corresponding period a year ago. However, delegates to the meeting showed optimism for the future, since the committee report demonstrated that an increase of 722,000 tons in manufacturing capacity is either in process or planned.

IMC Optimistic

A recent recommendation by the pulp and paper committee of the International Materials Conference that no newsprint allocations be made at the present time has been unanimously approved by member governments. The agreement was based on a report that 1952 newsprint production in the free world will reach approximately 8,928,000 metric tons, while total requirements will approach only 8,920,000 metric tons.

A committee study of the potential supply has shown that through more efficient use of existing mill facilities in the free world and by addition of new capacity this year production will be about 4 per cent, or 343,000 metric tons, above the 1951 output.

Construction of Canadian Newsprint Mill Proposed

Construction of a newsprint plant in the Lake St. John district of Quebec has been proposed to the Canadian government. Premier Duplessis, who said that the proposal will be considered, has declared that the project was put forward by John Murdock, Chicoutimi industrialist, and a group of business men.

The Premier stated that Mr. Murdock and his associates have the experience and resources required to make a success of the project. Overproduction of newsprint is one thing the Canadian government is trying to prevent, but that question did not arise in the project under study. Location of the mill would be St. Felicien in Roberval County, about 60 miles northwest of Chicoutimi.

April N. American Newsprint Output Highest on Record

Production of newsprint in Canada (including Newfoundland) during April amounted to 471,235 tons and shipments to 468,018 tons. Output in the United States was 94,767 tons, and shipments were 94,250 tons, making a total North American production of 566,002 tons and shipments of 562,268 tons, compared with continental production of 536,687 tons and shipments of 534,276 tons in April 1951. These figures, released by the Newsprint Service Bureau, show that the total output in April exceeded that of any April on record.

The Canadian mills produced 77,388 tons more in the first four months of 1952 than in the corresponding period of 1951, an increase of 4.3 per cent. The output in the United States was 25,378 tons, or 7 per cent greater than that in the first four months of last year, making a total continental increase of 102,766 tons, or 4.8 per cent more than in the comparable period of 1951.

Newsprint stocks at the end of April were 170,187 tons at Canadian mills and 8,969 tons at U.S. mills, a combined total of 179,156 tons, compared with 175,422 tons on March 31 and 153,764 tons at the end of April 1951.

Newsprint Co-ops Urged

That the shortage of newsprint "has serious implications for the freedom of the press in our democracy" was pointed out recently by Sen. Hubert H. Humphrey (Dem., Minn.) as he urged the formation of publisher-owned co-ops. As chairman of the Senate subcommittee on newsprint, he proposed that the co-ops manufacture and distribute newsprint to member-owners. Government loans for their establishment were suggested. Sen. Humphrey filed a report revealing a drop in newspapers from 2,600 dailies and 16,135 weeklies in 1910 to 1,772 and 9,591 in 1950.

Great Northern Paper Co. advanced the price of newsprint by $1 a ton to $116, effective April 1. This brings the firm's quotation in line with that of the industry in general.

Customs Court Cases

Forty-five cases involving shipments of coffee filtering paper imported at Pacific Coast ports have been decided by the United States Customs Court, which held the paper to be dutiable at 6 cents per pound and 20 per cent as tissue paper and not as filtering paper at 5 cents per pound and 15 per cent. Some of the cases have been pending in the courts since 1931, according to Warren B. Bullock, manager of the Import Committee of the American Paper Industry.

Seventeen cases have been abandoned in U.S. Customs Court by various importers who had claimed that the rate of duty of 1 cent per pound plus 5 per cent should be levied on handmade drawing paper instead of the rate assessed by Customs officials for handmade paper of 1½ cents per pound plus 7½ per cent. In a test case the court sustained this classification of handmade paper as being more specific.

A shipment of so-called standard newsprint from Canada has been classified for duty as printing paper because it bulked in excess of the maximum four points permitted by the definition of standard newsprint. The paper was entered at $145 per ton and was sold in this country at $200.

Other recent cases involving newsprint included the assessment for duty of two shipments of canary news imported from Canada through Malone and Newport, Va., which had been claimed duty-free

RICE BARTON

DynoPulper

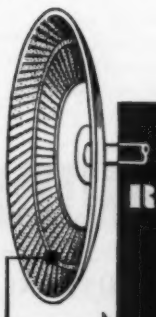
is comprised of a horizontal circular vat, having two DynoPellers. Stock may be charged all at one time, in bale or loose form, through the topside charging hopper.

Standard models of DynoPulper are designed for capacities of 500 to 2000 pounds. It may also be arranged for continuous discharge.

Laboratory size models are available.

● The DynoPeller

is the heart of all DynoMachines. Its concave face is lined with rough, hard carbide particles. As the DynoPeller rotates it causes a suction at its center that pulls the stock toward it. Centrifugal force then causes the stock to flow rapidly over the rough carbide particles under a gentle hydraulic pressure. This effective dynomizing action completely disintegrates the stock . . . separating each fiber from its neighbor while maintaining its original length.

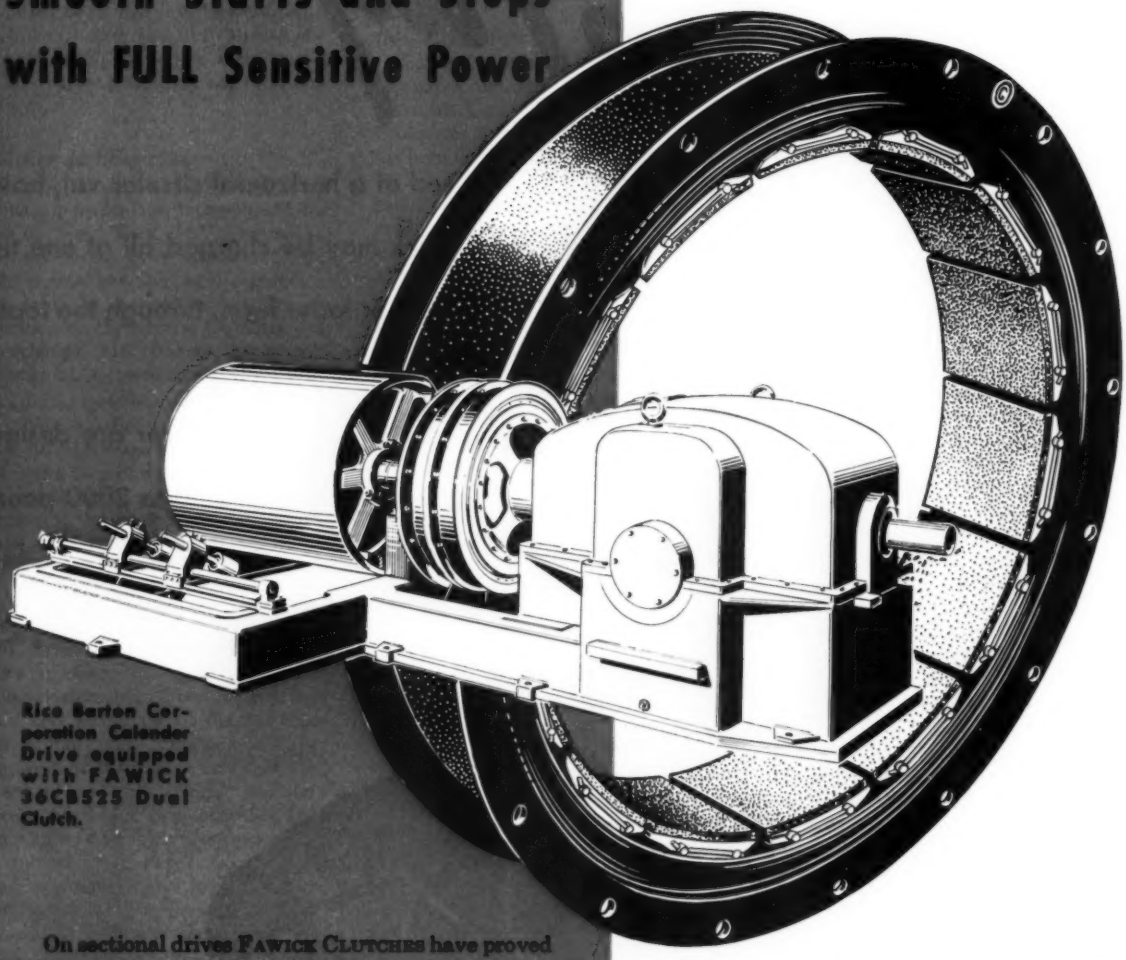


RBR 6-52

RICE BARTON
Research Corporation
WORCESTER 1, MASS.

FAWICK CLUTCHES DELIVER

Smooth Starts and Stops with FULL Sensitive Power



Rico Barton Corporation Calender Drive equipped with FAWICK 36CB525 Dual Clutch.

On sectional drives FAWICK CLUTCHES have proved that they not only deliver FULL POWER plus smooth starts and stops, but provide mill operators with many other advantages.

The simplied FAWICK design and rugged construction insure cooler operation, minimum wear, and sensitive drive operation from local or remote fingertip control. FAWICK CLUTCHES also eliminate "downtime" and labor for maintenance—they automatically adjust for wear and require no lubrication.

Try FAWICK on your sectional drives—they will improve the operation of your paper mill machinery.

For further information on Fawick Industrial Clutch and Brake Units, write to the Main Office, Cleveland, Ohio, for Bulletin ML-22.

The FAWICK AIRFLEX COMPANY, Inc.
9919 CLINTON ROAD • CLEVELAND 11, OHIO

FAWICK CLUTCHES PROVIDE YOU WITH

COOLER CLUTCH OPERATION
•
CUSHIONED, DEPENDABLE ACTION
•
SELF-ADJUSTMENT
•
LOW MAINTENANCE

FAWICK Airflex

INDUSTRIAL CLUTCHES AND BRAKES

as standard newsprint. So-called cull news imported from Canada as standard newsprint has been held for duty because it was outside the weight provisions of the definition of standard newsprint.

Newsprint cases abandoned by the importers in the Customs Court included two shipments at Seattle from Holland, held to have an excess of ash, one shipment at New York, with excessive ash content, and a second New York case in which the imported paper was outside the definition in both weight and ash content. In all the above cases the importations had been classified for duty as printing paper at 1/5 cents per pound and 5 per cent and denied free entry as standard newsprint.

Market Stabilization Needed for Wastepaper

Wastepaper firms and the mills they supply should attempt some agreement to stabilize the market, according to Paul A. Hadley, assistant to the general manager of Alton Box Board Co., Alton, Ill. He made the statement in an address before a Southwestern Division meeting of the National Association of Waste Material Dealers at Kansas City, Mo. Mr. Hadley cited the drop in sale price on common grades of wastepaper from $35 a ton in 1950 to $2 a ton today.

"The reason for this drastic drop in price is difficult to understand, but probably is due to scare buying by firms using wastepaper at the beginning of the Korean War," he said. "Most cardboard firms bought enough wastepaper to last a year or two at the fast business rate of 1950. Now business has decreased and they have large inventories of paper."

Dealers Burn Paper

At the same time that wastepaper drives are being conducted in the United States, many dealers are being forced to burn great quantities of surplus. According to Stuart B. Sutphin, Jr., president of the Waste Paper Institute of the National Association of Waste Material Dealers, in many cities building superintendents are paying to have their wastepaper removed, with much of the paper being eventually burned. He pointed out that many people still believe wastepaper to be a critical material, but that this is not the case, as the demand has dwindled drastically.

According to a report in the New York *Journal of Commerce*, eastern mill inventories are still high, without having been augmented by spring buying, and will have to decline before a pick-up in buying can get underway. As of the first week in May, mill stocks in the East amounted to approximately a 12-day supply of mixed grades, 16 days' of news, and about 20 days' of old corrugated boxes and high grades.

Wastepaper prices (f.o.b. New York) on May 13 were as follows: No. 1 mixed, $5 to $6 per ton; No. 1 news, $8 to $10; No. 1 hard white shavings, $100 to $110; No. 1 soft white shavings, $90 to $100; No. 1 soft white (one cut), $110 to $120; mixed books, $15; No. 1 hard white cuttings, $125 to $130, and No. 1 fly leaf shavings $20 to $25.

Paper Industry Investment Increased by Wellington

The $209,000,000 Wellington Fund, Philadelphia, one of the largest mutual investment funds in the country, substantially increased its common stock investment in the paper industry during the first quarter of 1952. The fund's investment in the common stock of paper firms on March 31 was $4,849,048, as compared with $3,507,525 at the close of 1951.

Wellington in the March quarter purchased 3,000 shares of Crown Zellerbach Corp.; 7,000 shares of International Paper Co.; 20,000 shares of Marathon Corp.; 13,000 shares of Scott Paper Co., and 400 shares of Union Bog & Paper Corp. The fund's common stock holdings in this group on March 31 were as follows: Crown Zellerbach, 15,100 shares; Marathon, 30,000; Union Bag & Paper, 14,400; Scott, 13,000; Kimberly-Clark Corp., 14,000; Weyerhaeuser Timber Corp., 9,000, and International, 12,000.

Shortage of Engineers Cited at Institute Executives Conference

The current dearth of college-trained engineers was keynoted at the 16th Annual Executives Conference of the Institute of Paper Chemistry, which was held in Appleton, Wis., May 15 and 16. More than 300 attended the gathering marking the school's 23rd year.

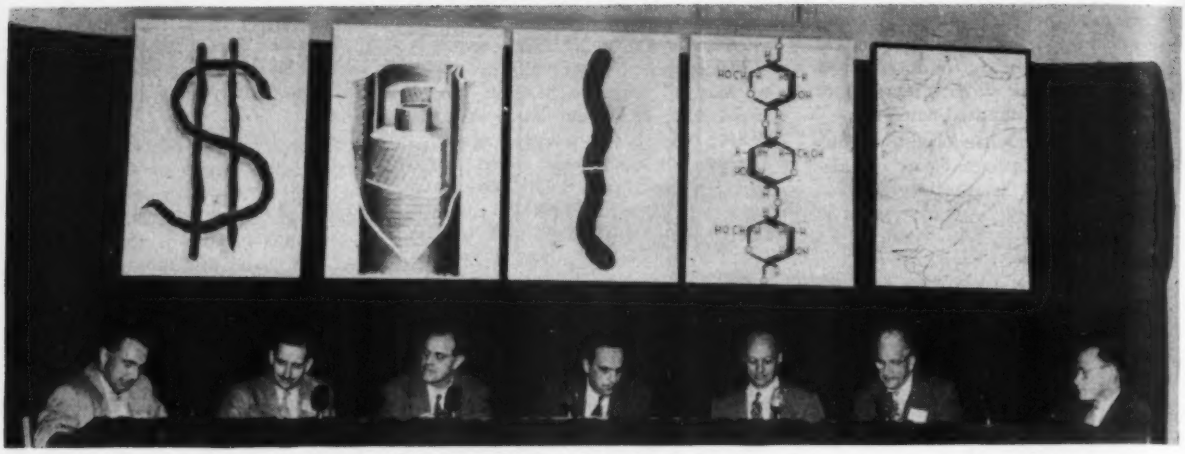
Demand far above the present supply was cited by Westbrook Steele, Institute president, as characterizing the situation in the field of industrial engineers. In his annual report Mr. Steele declared "... Reduction in enrollment has affected the higher institutions in various ways. Their incomes from tuition have fallen. The guaranteed tuitions of the GI Bill have virtually vanished. A concurrent effect has been that registrations in science and technology have dropped at a faster rate than have overall registration.... In 1949 and 1950, in all branches of engineering, approximately 50,000 bachelors and first professional degrees were conferred. In 1951, the number had dropped to approximately 41,000. This year the registrations in fourth-year engineering are less than 31,000; registrations in the third year (which should graduate in 1953) approximately 27,500; while the class that should graduate in 1954 shows an approximate registration of only 26,700. The first indication of an upswing in engineering is in the class of 1955, which approximates 39,500. All of this is 25 per cent below the experience of 1949 and 1950, and even optimistically we cannot expect all of those registered to carry through to their final degrees."

Demand High

"Now let us examine for a moment the demand for these men," Mr. Steele continued. "It is currently estimated by competent authorities that this year there are 80,000 engineering jobs to be filled, exclusive of the military requirements. This demand must be met by less than 41,000 engineering bachelors. . . . Since 1946 there has been a tremendous expansion in industry and government, with a collateral increase in the requirements for engineering talent.

SPEAKER at the annual dinner was Dr. Lee A. DuBridge, president, California Institute of Technology

"... In June of 1951 there were 3,600 first chemical engineering degrees conferred. This year, the number will not exceed 2,800. In 1953, the figure will certainly not exceed 2,200 to 2,300, and the class of 1954 should provide about the same number. In 1949, 4,000 first degrees were conferred in this field. It is not quite so easy to get statistics on the number of chemists. Chemistry majors, as they are defined in some reports, cover not only chemists but pre-medical students and those in other pre-professional training courses. In 1949, there were 7,400 earned first degrees in the field of chemistry. In June of 1951, only 7,000 first degrees in chemistry. The rough estimate for 1952 is 5,600. Bulk-



PARTICIPATING IN a panel discussion of papermaking fibers were (l to r) Donald J. MacLaurin, Edgar E. Dickey, Willis M. VanHorn, John G. Strange, moderator, Johannes A. Van den Akker, Kyle Ward, and Roy P. Whitney

ing the figures for chemists and chemical engineers, the area in which we are mainly concerned, we find a drop of about 30 per cent in available chemists and chemical engineers this year over last and a further shrinkage on the horizon for 1953 and 1954.

"Competitively, your Institute is in better shape than most other universities and graduate schools. We will have a higher percentage of our full registration than others. Unfortunately, there is little that can be done to improve the situation for the next three years. But, by taking positive and energetic action at this time, we can develop an increasing interest in science and a resultingly larger reservoir from which we may 'pick and choose.' "

Mr. Steele called for the pulp and paper industry to do its part by demonstrating to high school and younger college students the opportunities that scientific training presents. An excellent rallying point, he said, is the new brochure of the National Association of Manufacturers, "Your Opportunities in Science." The speaker declared that industry must compete more vigorously in the immediate future if it is to get high-quality technical men.

Reviews Year

In his report, Mr. Steele reviewed the past year, calling it one of much activity and growth. He reported the general membership approval to proceed with the plan for the General Activities Center. Final specifications are being drawn, he said, the Government has issued a permit for the construction, the financing is assured, bids are to be solicited, and it is confidently expected that construction will start before mid-year.

In the field of cooperative research for groups, he continued, the past year has shown increased activity. Of the 68 major projects undertaken, 21 have been completed, leaving 47 still in progress. Of these cooperative projects for groups, members and allied industry, 17½ per cent originate within 200 miles of the Institute; 9.6 per cent between 200 and 350 miles; 7 per cent between 350 and 450 miles; 4.3 per cent between 450 and 600 miles; 34.2 per cent between 600 and 1,000 miles; 17.8 per cent over 1,000 miles, and 9.6 per cent are national in scope. "This is concrete proof," he said, "that the Institute was not designed to be regional or sectional and has not been provincial in its outlook or services."

The speaker presented a review of the various different types of research work accomplished in the past year, listing the rivers in 15 states where stream pollution work has been carried out. He also pointed out that the Institute has been active in manufacturing and distributing vital equipment to the industry.

"This year has marked our greatest growth in membership since the original corporation was formed," Mr. Steele declared in his concluding remarks. "Since my report of last year, we have added the following members: Central Paper Co., Gibraltar Corrugated Paper Co., Weston Paper & Mfg. Co., Columbia River Paper Mills, Fox Paper Co., Simpson Logging Co., Schmidt & Ault Paper Co., Ball Bros. Co., Southern Paperboard Corp., and Coosa River Newsprint Co." In this connection, he predicted that the end of this fiscal year will see the books in balance.

Engineer Shortage a "National Calamity"

In an address before the annual Institute dinner, Dr. Lee A. DuBridge, president of the California Institute of Technology, said that "with the physical features of the world of the future depending largely on scientists and engineers, the shortage of scientifically trained personnel is "close to a national calamity." In the United States, with 160,000,000 people, only a half million are active scientists and engineers, and only a fifth of these are engaged in research—the search for new knowledge and the development of new products and techniques, he stressed.

Dr. DuBridge told the executives that he didn't know the answer to the shortage, but that he felt that not enough qualified young people are seeking careers in this field. He said that there is some possibility that the number going into scientific fields is leveling off.

Speculating on the future of the United States in a world partially dominated by Communism, the speaker made it clear that this country can and will be safe from such isms as long as the people are not hungry, are not homeless or housed in hovels, and have not only the necessities of life but a vast supply of the comforts of living.

Dr. DuBridge concluded with an optimistic speculation that the United States may be able to draw scientific brains from other parts of the world which are now virtually untapped. He added that, "We should right now be exploring our own resources. Are we finding the hidden talent that exists? I am sure we are not. Only half of our children who rank in the upper quarter on intelligence tests are even going on to college. This is an asset being wasted, and we should salvage the waste."

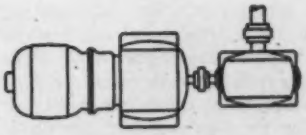
Papermaking Fiber Discussed

On the opening day of the meeting John Strange, vice president and treasurer of the Institute, led a staff panel discussion on "The Papermaking Fiber." Members of the groups were Donald J. MacLaurin, pulping and papermaking; Edgar E. Dickey, organic chemistry; Willis M. VanHorn, biology; Johannes A. Van den Akker, physics; Kyle Ward, cellulose chemistry, and Roy P. Whitney, chemical engineering.

In summarizing the conclusions that

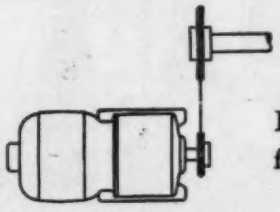
Which of these speed reduction jobs is yours?

High-ratio reduction with right-angle takeoff?



Get a LINK-BELT Worm Gear Drive

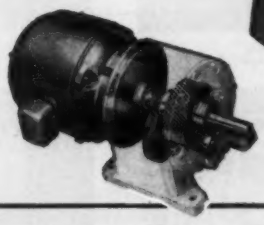
Reduction ratios: 3.1:1 to 8000:1. Torque: 1400 to 123,000 in. lbs. Output shaft rpm: 0.22 to 564. Drawing shows motorized P.I.V. variable speed and worm gear drives direct-coupled.

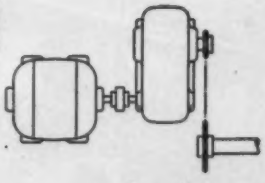


Restricted space for mounting?

Get a LINK-BELT Gearmotor

Reduction ratios: 6.2:1 to 292:1. Hp range: 1 to 30. Output shaft rpm: 6 to 280. Drawing shows gearmotor with roller chain drive.

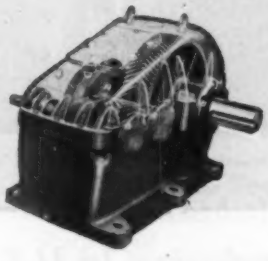




High hp with parallel shaft takeoff?

Get a LINK-BELT Herringbone Gear Drive

Reduction ratios: 2.84:1 to 318:1. Hp range: ½ to 1000. Output shaft rpm: 2 to 600. Drawing shows motor with herringbone gear and roller chain drives.



Yes, LINK-BELT builds all 3

NO LONGER need speed reduction be the limiting factor in a design or application problem. Because no *one* speed reducer solves every reduction problem, Link-Belt builds all three—Helical, Herringbone and Worm. Now it is only necessary to choose the right type of Link-Belt enclosed gear drive . . . and select the hp and reduction ratio that fit your requirements. You can get complete engineering information from the Link-Belt office near you

12,000

LINK-BELT

ENCLOSED GEAR DRIVES

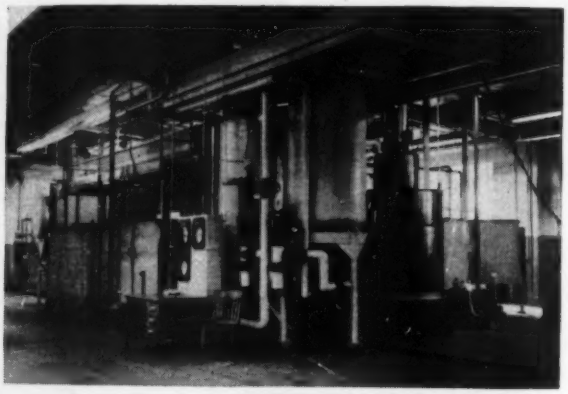
LINK-BELT COMPANY Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa), Sydney (Australia). Offices, Factory Branch Stores and Distributors in Principal Cities.

seemed to be indicated by the group inquiry, Mr. Strange noted that "in the first place, the papermaking fiber is *not* a simple, obvious structure. It is about as complicated as anything can be, and, in spite of all that has been done, it still presents many challenging riddles to the scientist and to the technologist. Although we have been using it for many generations, the papermaking fiber is still a stranger in many ways. And when its complex personality leads it to behave in fashions which are mysterious to us, we sometimes cover our confusion by observing that papermaking is 'art rather than a science.' This observation is a perfectly valid one if we realize that it is merely a temporary excuse for our ignorance. It can be a dangerous observation, however, if it leads to the complacent idea that the papermaking fiber is an irrational, capricious product of nature which will forever elude our adequate understanding and which we must somehow beguile into forming a sheet of paper.

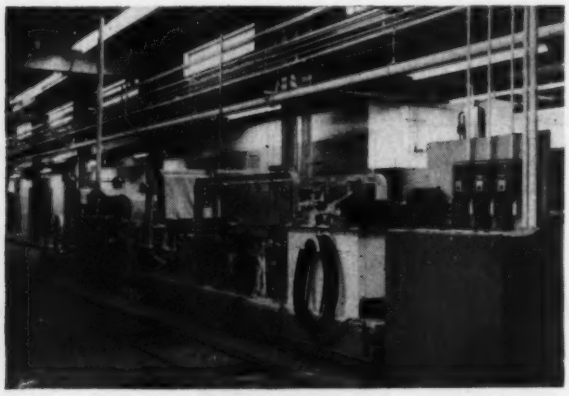
"The papermaking fiber comes to us through the wonderful, regenerative, photochemical process of nature. As we learn more about it, we may be able to influence its character from the time that it is born in the life-seed until it is ready to harvest. As we gain greater insight into the fiber's profound physical and chemical attributes, the papermaker will be less and less analogous to the chef who is making a tossed salad, adding various condiments as he works, but will become more and more a deliberate venture, where we act and we add because we understand more and thus can predict better."

The final day of the meeting was devoted to brief reports by third and fourth year students at the Institute.

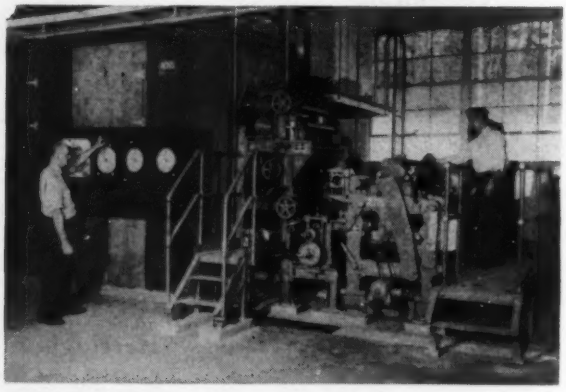
Crown Zellerbach's new development laboratory at Camas, Wash.



Integrated pulp plant at the C-Z laboratory



Miniature paper machine permits inspection of all parts



Coating machine provides five methods of treatment

Crown Zellerbach speeds research as . . .

Paper Industry In U.S. Plans Expanded Production

With the opening of its new development laboratory in Camas, Wash., Crown Zellerbach Corp. has begun an accelerated research program that looks toward many new types of paper and other products. The laboratory was opened May 1.

The firm, which has concentrated its research facilities at Camas, has added to its central research department a 17,000-square foot building that houses a complete miniature pulp plant, a miniature paper machine, and a versatile coating machine.

With this equipment, the new laboratory will carry the results of bench work research through the various development stages to the point of test runs in the C-Z mills and converting plants, Dr. Wendell Moyer of Camas, director of research, announced.

The facilities at the new development laboratories can completely duplicate the operation of a commercial mill, with the exception of a mechanical barker. Small hand-split and hand-barked pieces of wood, up to 5 inches in diameter, can be fed into the chipper and can be taken through the rest of the process automatically, as equipment provides for pulping, screening, pulp bleaching, pulp refining, and paper making. These facilities are integrated into the operation by piping and conveyors.

Some idea of the capacity of the tiny pulp mill can be obtained when it is realized that the digester, especially built for almost any pulping method, has a capacity of about 350 pounds.

The 40-foot experimental paper machine, in no sense a toy, is a combination cylinder and fourdrinier and can form

a sheet by either method. It is capable of producing a sheet 26 inches wide at speeds of 25 to 250 feet per minute, depending on the weight of the paper being made.

The coating machine can treat paper in five different methods to produce almost any result desired. It was specially built for the research work and is 50 feet in length, can coat a 25-inch sheet of paper at a speed said to vary from 30 to 300 feet per minute.

The laboratory was dedicated by J. D. Zellerbach of San Francisco, president of the firm. He forecasted that the research department would be enabled to make a fuller use of the timber received at the Crown Zellerbach mills.

Marathon Converting Oswego Plant

Four major developments are in full swing to hasten the conversion of Marathon Corp.'s Oswego, N. Y., plant to the manufacture of bleached paperboard used in food packaging. The facility, employing more than 300 personnel, was devoted entirely to the manufacture of unbleached kraft papers when Marathon acquired the property from St. Regis last summer.

One of the four new projects is the construction of a modern water treatment filtration system capable of delivering 5,000,000 gallons per day. Second development is the installation of a completely new stock handling system to provide flexibility in making a number of grades of paper.

Major addition to existing plant facilities is the building of a three-stage bleach plant. In addition to using unbleached pulp, the Oswego operation will use substantial quantities of bleached sulphite pulp manufactured by Marathon Paper Mills of Canada Ltd., at Marathon, Ont. The Oswego bleach plant is to be completed this summer; meanwhile, a temporary plant is in operation.

Rebuilding Paper Machine

Fourth phase of the over-all project is the rebuilding of the paper machine to manufacture paperboard. Changes or additions include a Vortrap system for dirt removal, changes in the electric drive to obtain operating speeds necessary for paperboard manufacture, addition of a size press, installation of another calender stack, and addition of a Clark-Aiken cutter for sheets. The machine is expected to produce paperboard stock for frozen food cartons in the near future. Excess machine time will be used for the manufacture of other grades of paper, bleached and unbleached. Until the present, Oswego's carton plant has been using board supplied by Marathon's Menominee, Mich., operation.

The New York operation is equipped with a battery of modern converting units. It has been manufacturing various types of cartons since October of 1951. Located on the shores of Lake Ontario, there is convenient water transportation for shipping the product.

ARCTIC CONDITIONS of 30 below zero are reproduced in tests to improve cellophane and develop new packaging films in the "cold room" of the new packaging materials laboratories of Olin Cellophane Division, Olin Industries, Inc., in New Haven, Conn. The heavily-clothed technician is shown operating a pendulum impact machine, while an associate outside the laboratory records the data

Paterson Parchment Announces Expansion

Paterson Parchment Paper Co. of Bristol Township, Pa., has recently reported two projects that will greatly enlarge production facilities. One is the construction of a coagulator, while the other consists of the erection of a filter bed. Mahony-Troast Construction Co. was to begin work on the projects in May.

Six hundred cubic yards of concrete will be used for the coagulator, 170 for the filter bed. The equivalent of approximately 100 truck loads of concrete must be poured continuously to achieve the monolithic form of the coagulator. The firm estimates that the work will be completed 16 weeks after construction begins.

Hopper Paper Starts New Paper Machine

Hopper Paper Co., Taylorville, Ill., on May 12 started its new paper machine which is the second step in a major expansion program that had its beginnings with the opening of a plant in Reading, Pa., in February 1946.

The curent $1,500,000 project includes new building construction of approximately 67,000 square feet to house a completely integrated paper making and stock handling unit. The fourdrinier, trimming 122 inches and constructed by Moore & White, is driven by a 275 horsepower steam turbine activating Syco-Drives and has a speed of 600 feet per minute.

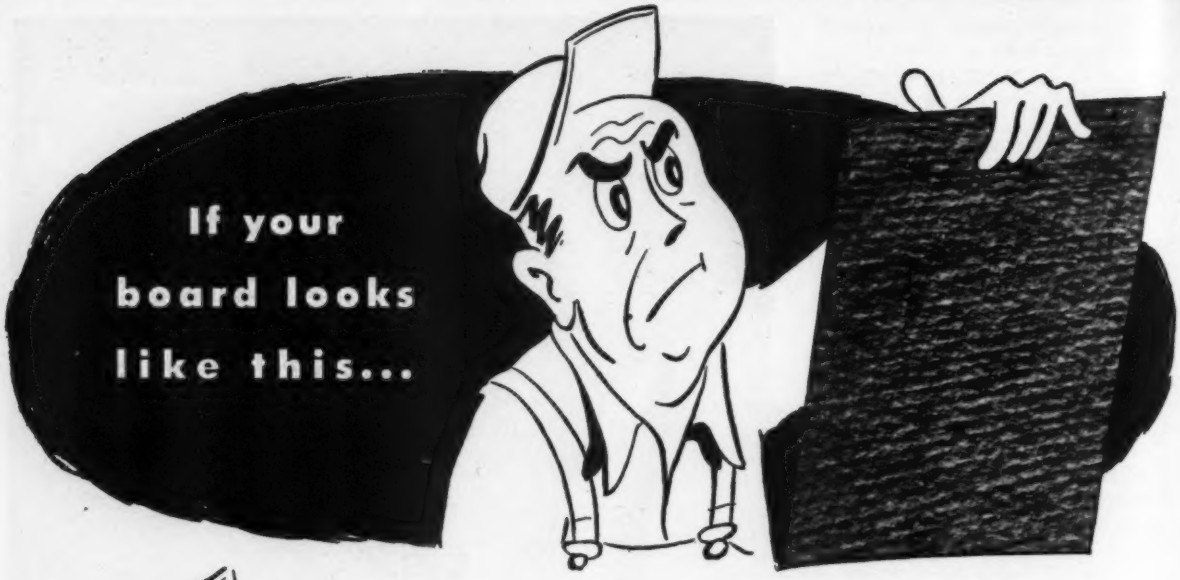
Consulting architects were Gregg & Briggs of Peoria; and V. Jobst & Sons, also of Peoria, were the building contractors. Building construction is poured concrete and steel. Ramp-type construction prevailed so that stock-handling from receiving docks to aquabrushers may be moved entirely by the most modern equipment.

The new addition includes the installation of sufficient stock preparation equipment, Jordans, and aquabrushers capable of handling the entire requirements of the new machine.

1954 Start-up Seen for Ketchikan Pulp Mill

Operation of the proposed Ketchikan Pulp Co. mill in Ketchikan, Alaska, is expected by June, 1954. This announcement was made by Lawson P. Turcotte, president. Mr. Turcotte said that the new plant, a joint venture of Puget Sound Pulp & Timber Co. and American Viscose Corp., will cost approximately $46,000,000.

The mill will have a 300-ton daily minimum capacity and will employ about 800 plant and logging personnel. It is to be located on a 55-acre site six miles from Ketchikan. The construction contract has been awarded to Howard



A Manchester Suction Drum Roll will help you!

You will also get: BIGGER PROFITS ★ INCREASED PRODUCTION ★ LONGER FELT LIFE ★ CLEANER FELTS ★ FASTER DRYING RATE ★ BETTER BUYER ACCEPTANCE OF YOUR PRODUCT

We will be glad to supply complete information without cost or obligation.

• • • • • •

A Few Other Manchester Products

Drum Winders • Adjustable Shake Motion • Pope Type Reels • Suction Press Rolls • Size Presses • Paper Machine Drive • Drilled Suction Couch Rolls • Cylinder Moulds • Complete Fourdrinier • Roll Grinding

THE MANCHESTER MACHINE COMPANY

1712 CENTRAL AVENUE • MIDDLETOWN, OHIO

SPECIALISTS IN PAPER MILL MACHINERY AND COMPLETE REPAIR SERVICE

S. Wright & Co. of Seattle and Guy F. Atkinson Co., San Francisco, who will build the plant under the firm name of Ward Cove Builders. Included in the general construction contract is the hydraulic barking plant, a digester building, a pulp washing and screening plant, a bleach plant, a power and steam plant, and a machine shop.

Magnesium Bisulphite Process

The product is to be produced by the newly developed magnesium bisulphite process. Waste pulp liquor, converted to industrial alcohol at the Puget Sound Pulp & Timber plant in Bellingham, Wash., will be used for power generation. Water to the new plant is to be supplied by a dam at Lake Connell, three miles from Ward Cove. An ultimate daily capacity of 50,000,000 gallons is planned.

A perpetual supply of timber has been assured the new plant through a contract with the United States Forest Service. A market for the pulp is guaranteed through a 20-year contract with American Vicose. Operating personnel are to be trained by Puget Sound Pulp & Timber.

Financing Announced

Details of arrangements for financing the Ketchikan mill were reported by Mr. Turcotte. They consist of the sale of Ketchikan Pulp Co. first-mortgage bonds to institutional investors to the extent of 80 per cent of the cost of the mill or $36,000,000, whichever is smaller; a loan of $3,000,000 to Ketchikan Pulp by Viscose, and insurance of common stock for $7,000,000, to be paid in equal amounts by Viscose and Puget, with each firm receiving one-half of the stock.

Dr. Frank H. Reichel, chairman and president of Viscose, is chairman of the board of the new corporation. William H. Brown, treasurer and secretary of Viscose, is vice president, treasurer, and a director. Robert H. Evans, director and legal counsel for Puget Sound Pulp & Timber, is vice president, secretary, and a director.

Other directors of the new firm are Fred G. Stevenot, chairman of the board of Puget Sound; John G. Jackson, director and general counsel for Viscose; Henry H. Bitler, director of Viscose, and Erik T. Ekholm, vice president of operations of Puget Sound.

National Container Signs First Valdosta Contracts

A contract has been signed between National Container Corp. and DeShong Land Clearing Co. to begin clearing the ground on a site south of Valdosta, Ga., where National will erect a $25,000,000 paper mill. This was one of the first contracts to be signed after the federal government issued a defense order granting critical materials to the project.

The land-clearing firm will clear the right-of-way and install the roadbed for a railroad to be built from the freight basing point, Eskay, to the mill location in Clyattville, 10 miles south of Valdosta. Meanwhile, Layne-Atlantic Co. of Albany is drilling the initial well at the site, and S.S. Jacobs Construction Co., Jacksonville, Fla., is working on office buildings.

Tax Certificates Granted to Pulp and Paper Industry

Certificates of necessity for accelerated tax amortization have been approved by the Defense Production Administration for ten firms in pulp and paper manufacture in recent weeks. The companies and the respective amounts of tax aid are as follows:

Badger Paper Mills, Inc., Peshtigo, Wis., 45 per cent of $177,682; D. M. Bare Paper Co., Roaring Spring, Pa., 35 per cent of $5,071,956; Crown Zellerbach Corp., Camas, Wash., 40 per cent of $320,270 and 40 per cent of $1,287,405; Everett Pulp & Paper Co., Lowell, Wash., 45 per cent of $2,940,000; Hammermill Paper Co., Erie, Pa., 50 per cent of $15,439,500; Hoberg Paper Mills, Inc., Green Bay, Wis., 40 per cent of $2,215,000; Hudson Pulp & Paper Co., Augusta, Maine, 40 per cent of $225,466; Nekoosa-Edwards Paper Co., Nekoosa, Wis., 40 per cent of $6,560,900; Oxford Paper Co., Rumford, Maine, 35 per cent of $1,200,000; West Virginia Pulp & Paper Co., Tyrone and Williamsburg, Pa., and Weyerhaeuser Timber Co., 40 per cent of $2,296,000.

Expansion Notes

Buckeye Cellulose Corp.
has announced that preliminary construction is now underway on its $20,000,000 pulp plant at Foley, Fla. When the plant goes into full operation next January, it will produce about 300 tons of pulp a day for manufacturers of high strength rayon and nitration pulp. About half of the wood to be processed at the plant wil come from Buckeye's 565,000 acres of timberland near Foley.

St. Regis Paper Co.
has announced that its new kraft unit, machine No. 4, is now in operation at Pensacola, Fla., and that it is expected that the new mill at Jacksonville will begin production during the fourth quarter of this year.

United Board & Carton Corp.
has announced that its board of directors has authorized the installation of a top liner and continuous hydrapulper system for filler stock at the Thomson paper mill.

Scott Paper Co.
has announced that construction on its $20,800,000 paper mill in Everett, Wash., is to begin in either June or July. The plant is to be built adjacent to the plant of Soundview Pulp Co., recently taken over by Scott. A certificate of necessity recently issued the firm by the DPA allows 40 per cent of the project to be written off in five years as depreciation for federal tax purposes.

Crown Zellerbach Corp.
has applied to the Corps of Engineers for a permit to drive piling for log raft moorage on the Columbia River along the north shore of Government Island. The moorage would extend 6,840 feet along the island, upstream from a point 230 feet upstream from dike 7.7, with a gap 700 feet wide at the ferry landing. The channelward limit for the work would be 260 feet from the low-water line.

Brunswick Pulp & Paper Co.
has completed purchase of about 50,000 acres in Wayne, Brantley, Applind and Brook counties, Ga., and Liberty County, Fla. The amount of money involved in the purchase was not revealed.

Rayonier Inc.
has announced that its research and development laboratory in Shelton, Wash., will undergo a $100,000 expansion. The addition will increase the size of the present laboratory by 8,700 square feet and is to be ready for use by October.

Buffalo Envelope Co.
plans a $200,000 expansion program. The firm will construct a three-story, 25,000 square foot addition to its main plant. Work is expected to be completed by December 1.

General Box Co.
held ground-breaking ceremonies recently at Waycross, Ga., for a factory that will manufacture paperboard cigar boxes and other cardboard containers. The firm will supply the entire box needs of the John H. Swisher cigar plant in Waycross.

American Israel Paper Mills Ltd.
has announced that its mill now under construction at Hadera, Israel, is expected to be in production by the middle of 1953. Its annual paper production of 12,500 tons is expected to supply half of Israel's needs and save the state an annual $1,500,000 in foreign currency. Joseph B. Mazer of Hudson Pulp & Paper Co., New York, N. Y., heads the list of foreign investors.

Charles Bruning Inc.,
manufacturer of technical paper, has opened a new plant in Teterboro, N.J. The structure, housing national manage-

ment offices, research laboratories, and manufacturing operations, occupies a 12½-acre site.

Paper Sales, Inc.,
Cincinnati, has announced the opening of new offices and warehouse facilities at 6318 Wiehe Road, Golf Manor. The new location provides three times the space available at the firm's former headquarters.

Continental Can Co.,.
Memphis, Tenn., has announced expansion plans that will include $35,000,000 to be spent on the paper container and fiber drum division. The Memphis plant, which was opened as a metal can producer in 1933, has been completely reconverted to paper cups and food containers, with 10 production lines plus auxiliary equipment for printing, waxing, and lid manufacturing operations.

Olin Industries Inc.,
East Alton, Ill., has purchased a 665-acre site on the Wabash River in Indiana. The property, located between Covington, Ind., and Danville, Ill., may be used as the site for a cellophane plant.

Paper Container Co.,
Chicago, has purchased a tract at Grand View, Mo., on which it plans to build a 90,000-square foot plant. When completed in October, the operation will employ about 150 people.

Mando Reveals Substantial Cost Reduction by Conversion to Lignite Fuel

A recent examination of production records by Minnesota & Ontario Paper Co. has revealed a substantial saving in steam costs since complete conversion to lignite fuel at the firm's Kenora, Ont., newsprint mill and partial conversion at the Fort Frances pulp and paper mill. According to company officials, with the conversion to spreader-type stokers Mando steam plants enjoy the major advantage of flexibility where either soft coal or lignite fuel can be used.

Company engineers have given approval to the use of lignite since the conversion of the four boilers at Kenora and three at Fort Frances. The fourth boiler at Fort Frances and the boilers at the International Falls, Minn., paper and insulation board mills still use bituminous coal. Lignite operation at International Falls in the near future seems doubtful because of the distance from lignite fields in North Dakota and the resultant high transportation costs.

On the other hand, the lignite strip mines from which Kenora and Fort Frances receive their fuel, are located in the Bienfait area of southern Saskatchewan. Coal would have to be shipped to these points from either the western part of Alberta or the United States.

Another advantage in the use of lignite, as pointed out by Mando engineers, is that since the fuel source is near the mill towns the supply will be less affected in case of a national emergency, thereby forestalling a possible shortage caused by sudden defense needs.

In addition to advantages in the fields of cost and transportation, the engineering department has discovered that because of the necessary alterations to the furnaces (in particular, the water-cooled walls), the conversion has resulted in increased steam capacity.

For comparative cost figures a company spokesman has cited the Kenora operation, since it was completely converted to lignite operation in the fall of 1950 with the installation of Foster Wheeler spreader-type stokers in the No. 2 boiler unit.

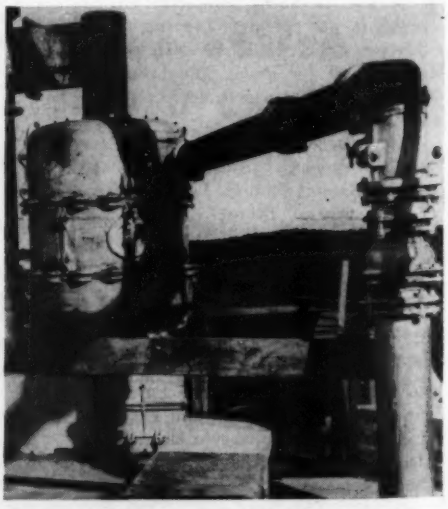
Prior to 1948 the four Kenora boilers consumed more than 35,000 tons of soft coal annually at a cost (using today's prices) of $392,000. During 1951 the cost of lignite fuel was substantially less. According to Mando engineers, the dollar savings are just part of the picture.

Equipment

The new spreader stokers replace old under-feed stokers that were installed at Kenora in 1925, the year the present steam plant began operation. After more than 25 years of use the stokers were badly worn, and it was decided to replace them rather than resort to repair. A major disadvantage of under-feed stokers is that, while the spreader type use either soft coal or lignite, the under-feeds can be used for only soft coal. Bituminous coal costs about twice as much at the mill as lignite. However, soft coal produces twice as much heat as lignite.

The installation of the Foster Wheeler spreaders involved not only the tearing out of the under-feed stokers but also changes in the brick and steel setting of the old boiler units. With the new stokers, there are no moving parts within the furnace, and a greatly reduced fuel bed depth is required when under full steam load. The addition of water-cooled walls effectively protects the furnaces from excessive temperatures and provides an additional steam capacity of 40,000 pounds per hour. These features

SPREADER TYPE STOKERS at Fort Frances newsprint specialty paper mill; three of the four were installed in 1950



RECEIVER TANK on roof of ash bunker; air drawn down from tank creates suction

APPLETON FELTS*

*for...

...service

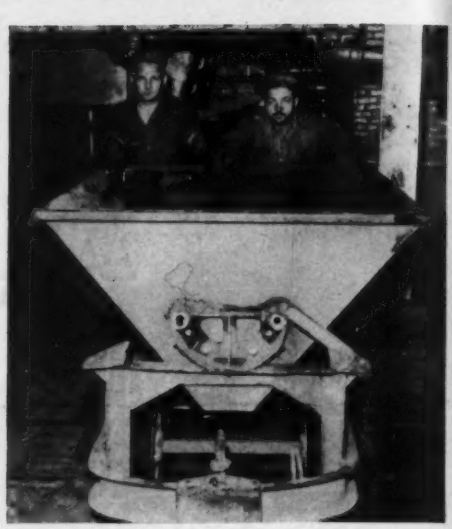
...uniformity

...dependability

...design and finish

APPLETON WOOLEN MILLS • APPLETON WIS.

ASH GATE on No. 3 furnace being opened, one of the few simple operations in removing ashes



REMOVED ASH is dumped into hole, where it is mixed with water

keep maintenance and replacement costs to a minimum.

The operation of all Kenora units has been very successful, according to J. T. Edwards, steam plant superintendent for Ontario-Minnesota Pulp & Paper Co. Over-all efficiencies, he said, are quite comparable to other types of fuel and equipment, and the maintenance to date has been negligible. Mr. Edwards sponsored the conversion program.

An average analysis for lignite received at Kenora during December 1951 is as follows: moisture, 33.72 per cent; ash, 5.84 per cent; sulphur, 0.55 per cent, and B.T.U./pound, 7178.

With the use of lignite, new ash removal problems arose at both Kenora and Fort Frances. These problems were solved at Kenora by the installation of a Nuveyor Pneumatic Ash and Fly-ash conveyor system manufactured by United Conveyor Corp., Chicago. When coal was used prior to 1948, the ash was wetted down and handled in ash cars. But lignite ash cannot be wet down without having the ash pack in the pit, making removal almost impossible.

The pneumatic system sucks the ash out of the pit into a receiver tank. From the tank the ash is unloaded into rail cars with the help of a dustless loader. The dustless loader has a rotating mixing drum in which water sprays are located. As the drum rotates, a scraper bar inside causes the ash to mix with water. The bar also sends the wet lignite ash via a chute to a railroad car. The entire operation is automatic and can be started or stopped by using a remote control button.

At the Fort Frances mill the ash is first passed through a crusher and then sluiced hydraulically through a pipeline to the mill yard. This system can be used because soft coal ash, which includes clinkers, is mixed with the dusty lignite ash.

Consolidated begins construction as . . .

Wisconsin Maintains Effort Toward Reducing Sulphite Pollution

Construction of the first building in Consolidated Water Power & Paper Co.'s program to cut the sulphite pollution of the Fox River at the Interlake Mill at Appleton is well underway. Steelwork has been erected on ground recently created by filling in an unused pond. The structure will house the mill's equipment for evaporating spent sulphite liquor. Interlake is preparing to cut its pollution by concentrating its sulphite liquor to about 50-50 solids and water, so that the material can be burned for industrial fuel.

The evaporating equipment, of recent Swedish design, was ordered from the manufacturer more than 18 months ago, but its fabrication has been repeatedly delayed by the scarcity of stainless steel created by the defense industry's need for this alloy. Delivery of part of the equipment is now scheduled for late in the summer, with the balance to be received a few months later.

All-Time Records Broken

Two all-time high records were broken in Appleton May 8 in the pulp and paper industry's program to find ways of preventing sulphite stream pollution. On that day the experimental furnace at the Interlake mill of Consolidated Water Power & Paper Co. completed its 30th full day of test-burning spent liquor as industrial fuel. On that same day the total liquor consumed in these tests passed 1,000,000 gallons.

Engineers and scientists originally believed that even after spent sulphite liquor of the usual 10 to 12 per cent solids content was condensed to 50-50 solids and water it could not support combustion unless burned along with some other fuel such as oil or powdered coal. Experiments conducted in an old furnace at Interlake proved that under proper conditions the condensed liquor can be burned alone.

Tests now being conducted are principally to determine the right size of burner to make good use of the most fuel and to reduce the ash escaping from the stack. Scheduled for early installation on the experimental unit are an air preheater, a dust collector, and an induced draft fan. The goal of company engineers is to have everything working smoothly by the time that the stainless steel evaporator equipment is delivered.

Badger Installs New Tank

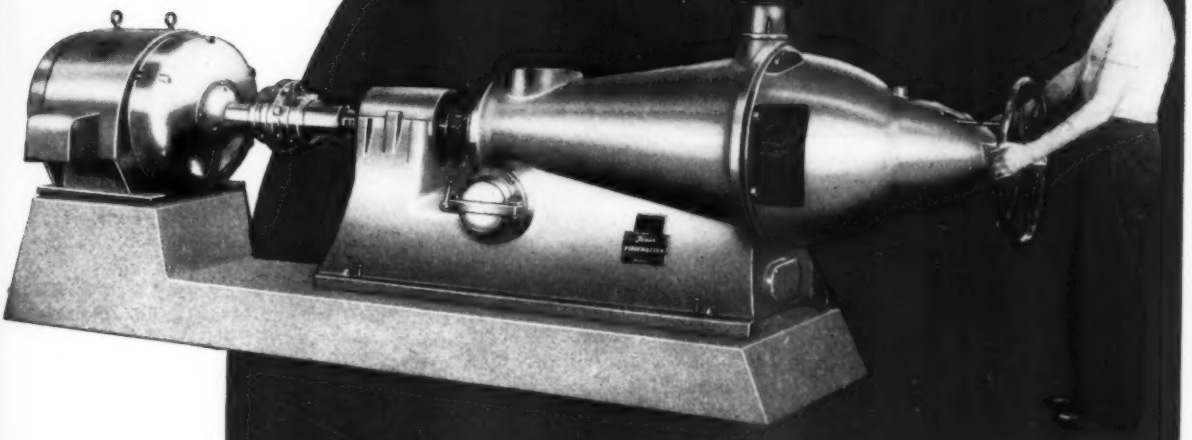
Continuing its program to reduce pollution in the Peshtigo River, Badger Paper Mills has installed a 100,000-gallon storage and collection tank at its Peshtigo pulp mill. The huge new tank is now in use to maintain steady supplies of spent sulphite liquor for loading into tank trucks that haul it away for use as road-binder and for disposal in the firm's ponding operations. The tank is equipped with outlets that can fill a

IF IT'S

Tonnage

YOU'RE AFTER

plus positive control, improved stock, greater flexibility and lower cost



E.D. Jones

Fibremaster®

IS YOUR ANSWER

The FIBREMASTER has twice the capacity of the famous Jones High-Speed Refiner. Yet its simplified, rugged design requires relatively little floor space.

And it has sacrificed none of the features of the smaller machine . . . its flexibility as a general utility unit for all stocks from news to rag, its improved stock control, economy of power, easy disassembly and low maintenance cost.

If you have a problem in high volume refining, you owe it to yourself to find out more about the FIBREMASTER

for more about what the FIBREMASTER can do for your and quality controls, write for Bulletin 202-1042.

Now Available with ACCRU-SET — automatic plug adjustment

This latest triumph of Jones engineering provides completely automatic, completely reliable finger-tip control of plug adjustment for uniform, pre-determined power throughout your stock run. Guarantees more uniform stock treatment, less operating horsepower, plus positive protection for plug and shell bars if power or stock flow fails.

Easily installed on any Jones Jordan, Fibremaster or Refiner. Write today for details.

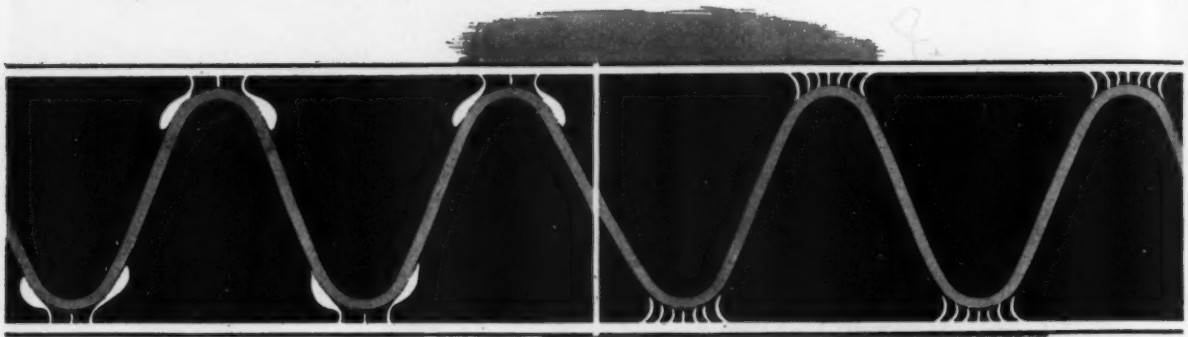
E.D. Jones

E. D. Jones & Sons Company, Pittsfield, Mass.

BUILDERS OF QUALITY STOCK PREPARATION MACHINERY

KELSIZE...

for Uniform Adhesive Application and Moisture Control in Corrugated Paperboard



NOT-this

UNCONTROLLED APPLICATION OF ADHESIVE

1. Excess adhesive.
2. Wasted adhesive serves no purpose.
3. More adhesive used . . . more moisture to remove.
4. Slower machine speeds.
5. Limp board.

this

CONTROLLED ADHESIVE APPLICATION WITH KELSIZE

1. Less waste . . . adhesive savings.
2. Adhesive where you want it . . . where it's needed.
3. Less adhesive used . . . less moisture to remove.
4. Higher machine speeds.
5. Reduced warping . . . stiffer board.

Only 15/100 of 1% of Kelsize in starch corrugated adhesive is required to give you these important advantages.

KELCO
REFINED ALGIN PRODUCTS

KELSIZE...a product of **KELCO COMPANY**

20 N. Wacker Drive
CHICAGO - 6

31 Nassau St.
NEW YORK - 5

530 W. Sixth St.
LOS ANGELES - 14

INSPECTING WOODROOM CHIPS while visiting Mando, the two Finnish visitors are guided by Harold Moxness (right), kraft mill superintendent

MANDO Visitors Report Finnish Sulphur Lack

Two pulp and paper engineers visiting pulp and paper installations in Canada and the United States told hosts at Minnesota & Ontario Paper Co., International Falls, Minn., that Finland is facing a severe sulphur shortage. The men, Olavi Sipila and Matti Makinen, are associated with United Paper Mills, Ltd., a Finnish firm operating five plants in four cities.

The two pulp and paper specialists reported that Finland's paper industry is flourishing despite the ravages and hardships caused by two recent wars. Their firm, one of the largest in Finland, is a major exporter of paper products, much of which goes to the U. S., England, South America, and India.

Pulpwood is plentiful in Finland, they said, but chemicals and other necessary materials are hard to get. They explained that nearly all chemicals and other ingredients are imported. "Sulphur," they said, "is in very short supply."

Speaking generally of the American paper industry, they agreed that paper making methods in the U. S. are "wonderful," but added: "Back home mill organization is not the same as it is in America."

3,000-gallon truck in less than five minutes.

The unit was designed so that in the future it can be used efficiently as part of the mill's spent liquor collection system for any other disposal or treatment method that might be adopted. Badger has been a leader among Wisconsin paper companies in experimenting with ways to burn spent sulphite liquor, using for its test liquor that was concentrated to less than 50 per cent water in the pilot evaporator plant of the Sulphite Pulp Manufacturers' Research League at Appleton.

Kalamazoo Mill Water Treatment Plans OK'd

Plans for a waste water treatment unit for the Monarch Division of Allied Paper Mills, Kalamazoo, Mich., have been approved by the Michigan Water Resources Commission. "The system as proposed," said the commission's report, "appears to be reasonably capable of complying with requirements in the commission's final order of termination . . . Approval of your plan is hereby granted with the understanding that the beds as shown are not considered to be a permanent answer to the sludge disposal problem . . . Final approval of the system will be postponed pending a determination of its performance."

The firm had failed to submit its plans by March 1, the deadline set by the commission, and was warned of the necessity for compliance. With the exception of Allied's Monarch and King mills, paper mills in the Kalamazoo River Valley face a joint time limit of June 1, 1954, for compliance with the final WRC pollution abatement orders. The Monarch and King deadlines are September 1, 1953.

Hatchery Trout
at Woodruff, Wis., have thrived on a diet in which torula yeast made from spent sulphite liquor took the place of traditional ingredients, according to a report appearing in *The Progressive Fish-Culturist*. The paper mill by-product is produced at Rhinelander Paper Co.

Unpaved Roads
in Wisconsin that were treated last year with sulphite roadbinder came through the winter with a minimum of frost damage. All roads checked in the Appleton area showed some damage, but damage on treated strips was less severe and involved small fractions of the total surface. During 1951 in Wisconsin alone more than 23,000,000 gallons of the spent liquor were used in the roadbinder program.

NEPCO Begins Free Health Examinations

A program of company-sponsored physical examinations for all employees has been inaugurated at Nekoosa-Edwards Paper Co., Port Edwards, Wis. The plan calls for examinations by local physicians conducted on company time and completely financed by the firm. An important feature of the new program is that of regularly-scheduled follow-up medical checks and personal consultations with company nurses on individual health problems.

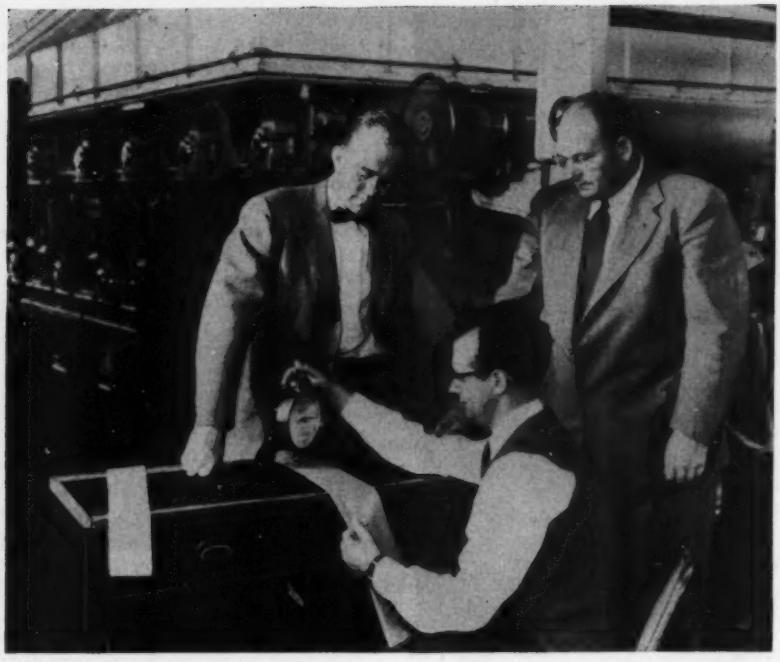
The first examinations, beginning with top Nepco executives, were undertaken April 1. Completion of the initial series of check-ups will require several months. The firm has more than 1,800 employees. In announcing the step, John E. Alexander, president and general manager, declared, "For many years we have required pre-employment examinations for people who join our organization. A natural extension of this service is to provide periodic check-ups for all employees."

Industry Notes

Five Canadian Mills
were toured recently by 21 senior and graduate students of the pulp and paper curriculum at the College of Forestry, Syracuse, N.Y. The firms visited included: Howard Smith Paper Mills Ltd., Cornwall, Ont.; E. B. Eddy Co., Hull, Que.; International Fibre Board Ltd., Gatineau, Que., Kenwood Mills Ltd., Arnprior, Ont., and Canadian International Paper Co., Gatineau.

7,000 Tons
of waste paper were destroyed April 21 at the terminal yards of Southern Trucking Co., Fairview, N. J.

Shellmar Products Corp.
has created two new subsidiaries to facilitate foreign business. The new corporations, Shellmar International Co.



MIKING capacitor paper on a Rice Barton machine is demonstrated by Peter Della Luna, mill superintendent at Stevens Paper Co. in Westfield, Mass.; looking on are W. E. Bright of Rice Barton and R. J. West, Stevens general superintendent

and Shellmar, Ltd., will work with the firm's foreign plants and affiliates in Mexico, Colombia, Brazil, Peru, Australia, Union of South Africa, Canada, and England.

Several Thousand Dollars Damage
was caused by fire April 18 at a warehouse of Gardner Board & Carton Co., Middletown, Ohio. The blaze broke out among bales of corrugated paper stored for processing into milk cartons.

Three Virginia Firms
have offered bids for pulpwood on the A. P. Hill Military Reservation near Fredericksburg, Va. They are: T. Frank Flippo & Sons, Doswell, $3.65 per cord; Thomas M. Brooks Lumber Co., Inc., Richmond, $3.05, and Chestnut Valley Corp., Corbin, a bid based on several categories and varying from $3.60 to $5.25.

Gas and Oil Exploration
was continued last year on the Louisiana timberland holdings of Gaylord Container Corp. The firm owns some 400,000 acres in the state. Both minerals have been discovered either on lands owned by the company or close by.

Kimberly-Clark Corp.
has filed articles of incorporation for the Kimberly-Clark Foundation. However, officials of the firm would issue no statement for the time being. The articles disclose that the foundation is to dispense funds for "charitable, religious, scientific, literary and educational" purposes. There was no indication of the foundation's finances, nor were any trustees or directors named.

Riegel Paper Corp.
has announced the moving of its New York, N. Y., offices from 342 Madison Ave. to 260 Madison Ave. The firm will continue to use its present mailing address, P. O. Box 170, Grand Central Station.

First Pulp Boat
of the 1952 season docked in Waddington, N. Y., eight days earlier than in 1951. The *S. S. Southcliff Hall* unloaded 1,500 cords of peeled balsam and spruce consigned to St. Lawrence Paper Corp. at Norfolk.

Wood Pulp
producer stocks at the beginning of April totaled 124,000 tons, 9 per cent above the previous month and 30 per cent higher than a year ago.

Sorg Paper Co.,
Middletown, Ohio, has moved its New York, N.Y., sales office from 370 Lexington Ave. to the Postum Building at 250 Park Ave.

"Quartz Paper"
is a new development recently announced by Glass Fibers Inc., Toledo, Ohio. The firm has duplicated quartz chemically in the form of fibers. Initial use of the new paper will be as a high-temperature electrical insulating material. The glass fibers to be used in making the quartz paper are now available to paper makers only in small laboratory quantities.

An Explosion
at Dejonge Paper Mfg. Co., Fitchburg, Mass., caused damage unofficially estimated at $750,000 April 30. Some 300 employees had left the plant only a short time before. One workman was injured slightly by the blast.

Pulpwood Brought Extra Dollars
into the pockets of Tift County, Ga., forest owners during every week of 1951, with from 15 to 25 cars on an average being loaded every six days.

Hammermill Paper Co.,
Erie, Pa., has announced plans for establishing a Good Neighbor Fund, through which employees will contribute to such drives as Red Cross, Community Chest, March of Dimes, etc. A payroll deduction plan is to be used.

Crossett Paper Mills Co.,
Crossett, Ark., has donated an x-ray unit valued at $10,000 to the Crossett Health Center.

Argentina's Peronista Party
has ordered all party offices to cut writing paper consumption in half by using both sides of every sheet. The move is part of President Juan Peron's national austerity campaign.

101 Employees
of Minnesota & Ontario Paper Co. qualified for membership in the firm's 25-year Old Timer's Club during 1951. One worker in every six of Mando's 5,000 employees has been with the firm 25 years or more. In joining the ranks of the club, the men and women will receive gold rings.

Beverage Carriers
produced by Atlanta Paper Co., Atlanta, Ga., have been chosen by the U.S. State Department to be exhibited at Helsinki, Finland. The exhibit, entitled "Carnival of Cartons," has also been cited by the International Packaging Exhibition in Paris.

Wayne University,
Detroit, Mich., has announced a new research and training center to meet a growing need in the packaging industry. The center will be devoted to the study of handling, packaging, and warehousing of industrial materials. The unit, to be established in the School of Business Administration, will cost approximately $75,000 a year. Evans Products Co., Plymouth, made the first contribution of $5,000.

QUAKER'S expanded rubber roll covering department; new Lobdell grinder in foreground

16-TON crane lowering finished roll into case for shipment at the Quaker plant

Quaker Expands Rubber Roll Facilities

Expansion of its rubber roll covering facilities at a cost of $100,000 has been completed by Quaker Rubber Corp., a division of H. K. Porter Co. Inc., Philadelphia. The firm planned the project to meet the increased demand for rubber covered rolls by the pulp and paper, steel, printing and textile industries, as well as manufacturers of equipment for these industries.

Included in the new department are the latest type lathes, grinders, overhead traveling cranes, testing and laboratory facilities. With the new equipment and plant layout, Quaker can now apply rubber coverings to rolls measuring 17 feet in length and weighing as much as 16 tons. Coverings of crude rubber, Neoprene and many other synthetics are available in various degrees of hardness.

Beckman Instruments Adds 14th Building at Pasadena

To meet the expanding demand for industrial electronic instruments, Beckman Instruments Inc. has recently added another building to the 13 it already occupies in the South Pasadena and Pasadena, Cal., area. The newest plant, a glass and fieldstone unit similar to the others in the Beckman group, will house the personnel departments, as well as a new Special Products Division in which engineering and production facilities are centralized for the development of new types of metering instruments.

The building, in addition to the offices, includes a laboratory and manufacturing area where at the present time such special instruments as phase equilibrium computers, electrophoresis convection apparatus, moisture determination meters, etc., are in production.

The new Special Products Division is under the direction of J. F. Bishop and will be devoted primarily to the study and development of special instruments brought to it by industrial organizations. There are complete development and production facilities particularly designed for the manufacturing and testing of custom-built instruments.

Solvay Completes N. Y. Soda Ash Plant

The Solvay Process Division of Allied Chemical & Dye Corp. recently marked completion of its new multi-million dollar soda ash plant in Syracuse, N.Y. The plant, embodying the latest equipment in alkali manufacturing, is the key project in the firm's modernization program which was started at the close of World War II and has involved capital investment of more than $20,000,000.

The 220-foot structure is equal in height to a 15-story office building. It is constructed of concrete and steel, faced with buff-colored tile, and incorporates extensive use of glass blocks. Its construction took two years.

During the dedication ceremonies A. B. Chadwick, Solvay president, turned over to R. G. Zimmer, plant manager, a glass key symbolic of one of the major uses of soda ash as a basic alkali by other industries. Hugo Riemer, executive vice president; Carlton Bates, vice president; H. R. Margetts, director of operations, and D. O. Yeoman, director of development for the Solvay alkali section, also participated.

J. O. Ross Dedicates New Jersey Plant

More than 500 persons attended the official opening of J. O. Ross Engineering Corp.'s new Highland Park, N.J., plant April 12. The multi-million dollar operation will be known as Plant No. 3, other Ross plants being at New Brunswick, N.J., and Montreal.

The Highland Park plant adds more than 75,000 square feet to the firm's present manufacturing facilities. Of brick and steel and of fireproof construction, it is equipped with the latest machinery for the fabrication of sheet metal. These facilities provide complete power equipment for shearing, bending, and multiple punching, and every type of welding equipment, including the

MODERN PLANT of Beckman Instruments Inc. recently opened at Pasadena, Cal.

NEW ADMINISTRATION building recently occupied by Chain Belt Co. in Milwaukee

Praises from Men Who Know put

FIRM AWARDED BROCHURE PRIZE

LOS ANGELES, Calif.—Advertising experts representing agencies in[illegible] of the country submitted [illegible]es of their creations to a judging here, and a finely printed, informative and technically comprehensive brochure issued by the Sandy Hill Iron and Brass Works of Hudson Falls, N. Y., won first prize as an outstanding piece of advertising literature for a manufacturer.

The First Advertising Agency Group, made up of agencies in major cities of the [illegible] created over a period of [illegible] more than a year. All judges voted that the unusually complete content, the technical accuracy, and the interesting manner of handling the Sandy Hill book earned it first prize.

The Sandy Hill brochure presents the line of products of the Hudson Falls firm in twelve sections, illustrating, describing and analyzing the functions of related pieces of equipment made by Sandy Hill. For instance, one section treats of the Sandy Hill Selective Drive, and others cover the following subjects: Bertrams Shake, Multi-Cylinder Board Machine, General Purpose Paper Machine, International Grinder, Kamyr Grinder, High Speed Newsprint Machine, Kamyr Pressure Filter, Kamyr Wet Machine, Standard Wet Machines for Paper Making or Pulp Lap Forming, High Speed Tissue Machine.

The book is replete with half-tone illustrations, and with artists' drawings of equipment, with engineers drawings to amplify the uses and typical installations.

Hevenor Advertising Agency, Inc., of Albany, which handles the Sandy Hill Iron and Brass Works account, prepared the book.

From the very first day that our comprehensive Sandy Hill Brochure came off the press, we have been receiving "rave notices" from every direction. We sincerely appreciate it, and thank those who have taken the time to write or to compliment us in person.

Of course, the primary purpose of this brochure is to delineate the products of Sandy Hill, but we have endeavored at the same time to compile a "ready reference" book of the pulp and paper industry for the assistance of those making decisions and those doing research in the field.

Our eagerness to be helpful does not stop with the production of this catalog. Our large, proficient engineering staff is ready to give you every possible assistance with your particular mill problem. Just give us a call.

Below are typical examples of page spreads in the Brochure. At left is a triple-page spread describing the Sandy Hill Selective Drive. At right is a double-page spread featuring a general pulp and paper mill scheme with Sandy Hill Equipment and Kamyr Pulp Bleaching.

Efficient Operation; Economical Maintenance

The elements of the Sandy Hill Selective Drive comprise a line shaft on interchangeable roller bearings, adjustable V belt sheaves, composition sheaves, V belts, set of coupling, right angle gear reduction unit, pinion shaft with standard and interchangeable roller bearings, gear shaft on interchangeable roller bearings, gear casing and flexible coupling. Compared with any other type drive it has a minimum of moving parts and parts subject to failure. It presents no maintenance problems beyond the ability of a good paper mill millwright, whose services will be mainly confined to inspection and infrequent adjustment. Installation of the Selective Drive eliminates the need of a basement or steel superstructure for a line shaft. The line shaft is installed on the floor on low piers, not over eighteen inches high.

Sandy Hill SELECTIVE DRIVE

The unit and elevation of an [illegible] (Sheet shown)

Side elevation of drive for one section, including right angle reducing gear (double reduction). Either single or double reduction can be supplied as speed and power requirements indicate. Clutch and fixed diameter sheaves are shown.

End elevation of drive for one unit, showing relation of line shaft to unit. It also shows special V belt takeup idler and counterweight.

Sandy Hill Catalog in "Best Seller" Class

JUST A FEW of the complimentary messages received from leaders in the pulp and paper industry:

Congratulations to you and yours on your most interesting and instructive catalog, which I thoroughly enjoyed reading last evening.
Henry D. Schmidt
Schmidt and Ault Paper Co.

I want to express my sincere appreciation for having received this excellent catalog, which will be circulated among the different production executives of our organization.
Erik Fernstrom
Fernstrom Paper Mills, Inc.

You are certainly to be congratulated on the very creditable performance of your company. It is always a pleasure to see the progress Sandy Hill has made since my first acquaintance with it in 1915.
C. R. Seaborne
Thilmany Pulp and Paper Co.

We take pleasure in acknowledging receipt of your very handsome and complete catalog. We have put it where it will be referred to many times. Our business relations with your good company have been very pleasant.
M. D. Southworth
Southworth Paper Co.

Excellent presentation of modern paper mill machinery.
E. G. Cowart
Gulf States Paper Corp.

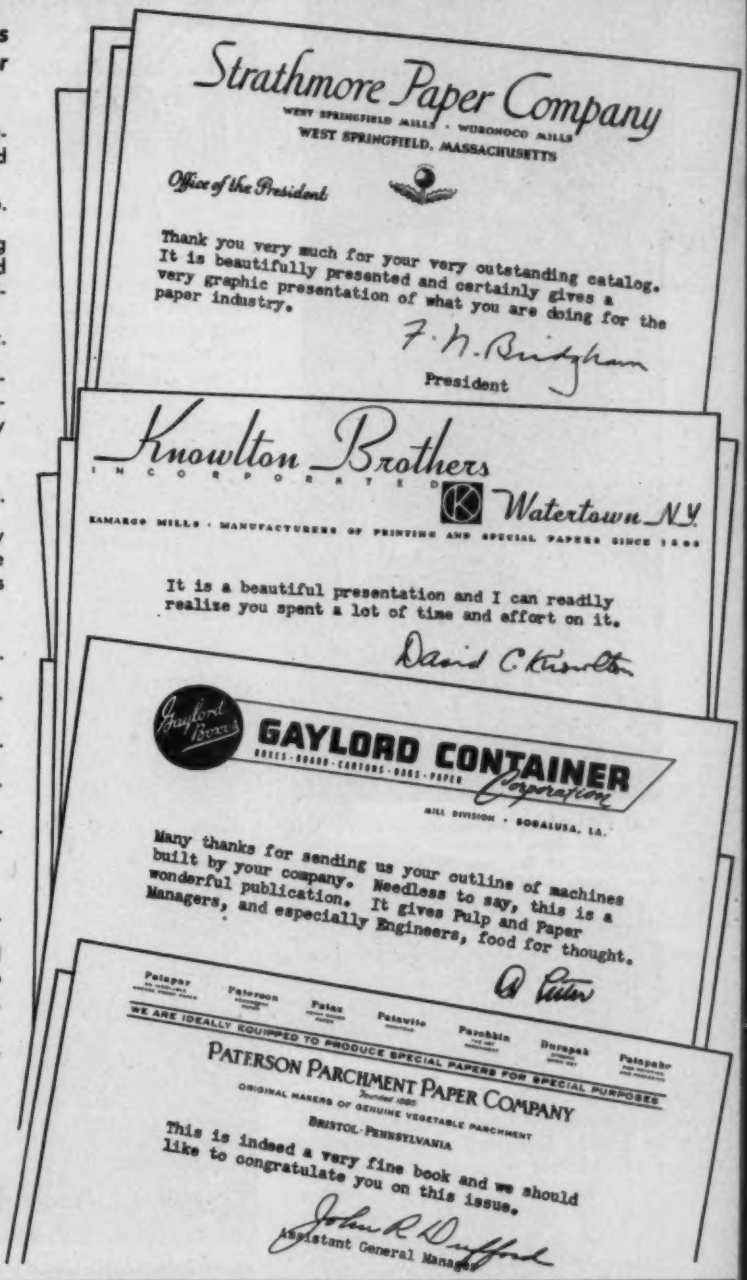
Beautiful catalog — one of the best I have ever seen.
A. G. Wakeman
Coosa River Newsprint Co.

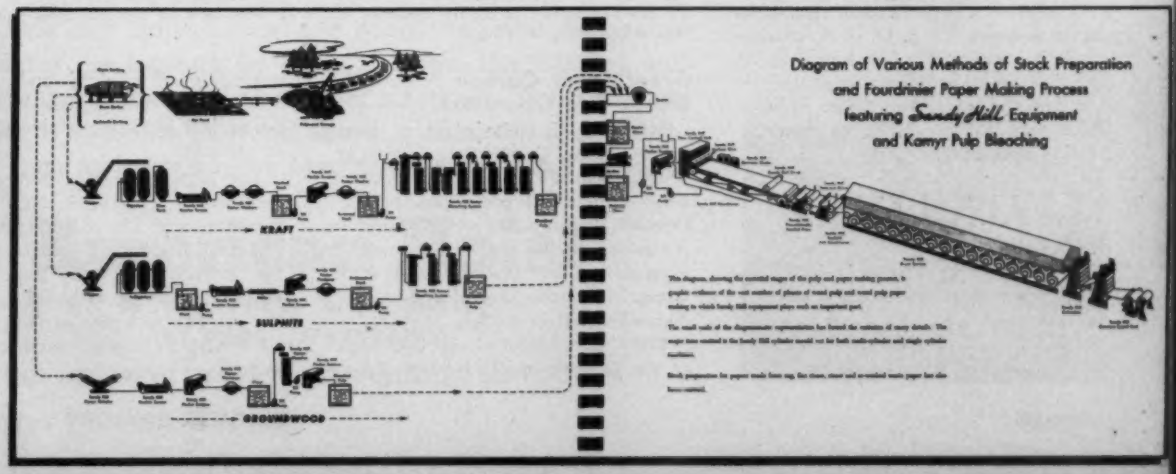
I hope copies have been sent to our mill offices.
C. W. Gallup
New York and Pennsylvania Co., Inc.

I wish to thank you very much for sending this wonderful catalog which I have examined and have turned over to our General Superintendent, who is also pleased with it.
W. L. Dawson
The Hamersley Manufacturing Co.

If you do not have a copy of this complete catalog, write for one today.

The Sandy Hill Iron & Brass Works
Hudson Falls, N. Y.


Strathmore Paper Company
WEST SPRINGFIELD, MASSACHUSETTS
Office of the President
Thank you very much for your very outstanding catalog. It is beautifully presented and certainly gives a very graphic presentation of what you are doing for the paper industry.
President
Knowlton Brothers
INCORPORATED
Watertown N.Y.
It is a beautiful presentation and I can readily realize you spent a lot of time and effort on it.
GAYLORD CONTAINER Corporation
Many thanks for sending us your outline of machines built by your company. Needless to say, this is a wonderful publication. It gives Pulp and Paper Managers, and especially Engineers, food for thought.
WE ARE IDEALLY EQUIPPED TO PRODUCE SPECIAL PAPERS FOR SPECIAL PURPOSES
PATERSON PARCHMENT PAPER COMPANY
ORIGINAL MAKERS OF GENUINE VEGETABLE PARCHMENT
BRISTOL, PENNSYLVANIA
This is indeed a very fine book and we should like to congratulate you on this issue.
Assistant General Manager


KRAFT
SULPHITE
GROUNDWOOD
Diagram of Various Methods of Stock Preparation and Fourdrinier Paper Making Process featuring Sandy Hill Equipment and Kamyr Pulp Bleaching

PLANT OPENING ceremonies are conducted by J. O. Ross, president, at the recent dedication of the new Ross operation in New Jersey

latest development for welding aluminum. The plant can handle sheet metal, aluminum, stainless steel, copper, sheet steel, plate fabrication, duct work, and assemblies.

Factory offices and a testing and research laboratory are incorporated in the structure. The laboratory has units large enough to produce results that can be exactly duplicated on a commercial scale. Various types of ovens, dryers, and handling apparatus, along with a multiplicity of recording instruments, are utilized for testing purposes; all sources of heat are available.

Guests at the dedication ceremonies were welcomed by J. O. Ross, founder and chairman of the board, and S. W. Fletcher, president. Present at the reception and party was Ryan Sadwith, vice president in charge of manufacturing operations.

Allied Notes

Diamond Alkali Co.
has announced a change in its expansion plans that will increase chlorine-producing capacity by 10 per cent at its Houston, Texas, plant. The additional capacity, required for the manufacture of perchlorentylene, was originally scheduled for the new plant at Painesville, Ohio.

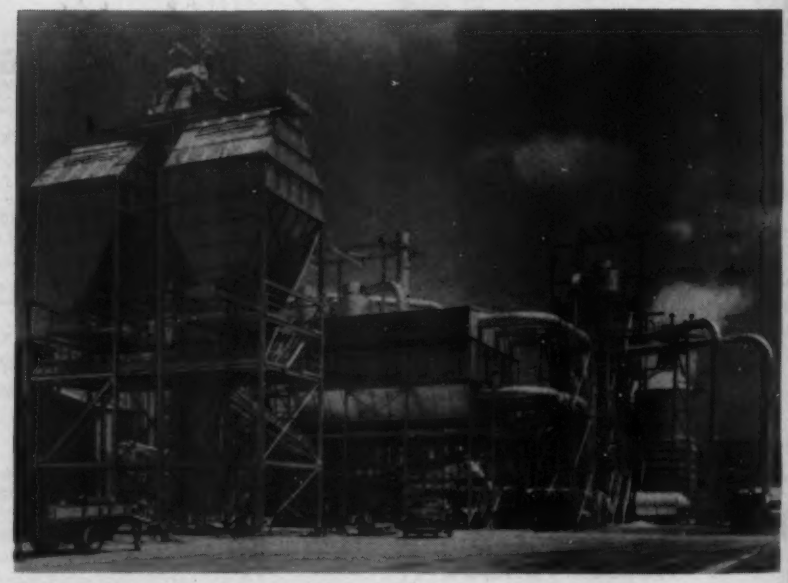
American Cyanamid Co.
will build a plant near New Orleans for the production of chemicals from natural gas. The move will place the firm in the vast field of basic production from hydrocarbons. As initially projected, the plant will produce ammonia, acetylene, hydrocyanic acid and derivatives of these products, among them acrylonitrile and ammonium sulphate. The operation will represent an investment of about $50,000,000 and will be located on a 600-acre site about 10 miles south of New Orleans.

Hercules Powder Co.
will build facilities to convert by-product hydrochloric acid to chlorine at its toxaphene plant at Brunswick, Ga. The unit will consist of a large compressor house, a reactor enclosure, and substantial yard equipment, including drying equipment, condensers, pumps and other auxiliaries. Completion is expected by the end of the year.

Paper Machinery & Research Inc.
has announced the completion of an extensive expansion program, including the addition of another building at Roselle, N.J. The project also includes several new lathes, new engraving machines, and a dynamic balancing machine said to be one of the largest in the East. Steel warehousing space has been enlarged, with overhead traveling hoists and special handling equipment added. Automatic cutting saws further facilitate the prompt handling of orders.

Acme Steel Co.,
Chicago, has announced that preliminary construction has started on Acme Steel Co. of Canada Ltd.'s $980,000 plant at Scarborough, Ont. Expected to be completed in the fall, the Scarborough Works will manufacture flat steel strapping and seals for container reinforcement.

A. E. Staley Mfg. Co.
Decatur, Ill., has established sales offices at Cleveland and Philadelphia, it was announced recently by L. S. Roehm, corn division manager. The new offices



VIEW of the new diatomite plant of Great Lakes Carbon at Lompoc, Cal.; here is illustrated the complex system of piping, cyclones and bins, with some of the structures rising higher than a four-story building

Great Lakes Carbon Starts Cal. Operation

The new diatomite plant of Great Lakes Carbon Corp. at Lompoc, Cal., which began shakedown runs April 4, when into actual production recently. Operating adjustments were to continue for several weeks, but full output was expected in May. The new plant is the largest complete unit for processing diatomite built in the last 22 years.

With the addition of the full output of the Lompoc operation, capacity for production of calcined and processed filteraids and fillers by the Dicalite Division will be increased approximately 80 per cent.

The plant is of the "outdoor" type, according to Edward A. Harris, operations manager. The only operation in an enclosed building is the final bagging of the finished products. Some of the equipment was virtually tailor-made for the job. For each step in the processing there is an automatic centralized control system.

IF YOU NEED A Money-maker...

If you're losing money on an old crane or shovel, let's put a new 3/4-yard American Crawler to work for you... *right now*. You'll never know how many extra loads one man can move in a day until you see him handle the new American. We've cut his legwork by 60%... given him comfort and easy control undreamed of in older machines. The American Crawler is available as crane, shovel, pull shovel or dragline. Every item in today's news says *now is the time to buy.*

2702H
42

American Hoist
& Derrick Company
ST. PAUL 1, MINNESOTA

SOLD AND SERVICED THROUGH AUTHORIZED DISTRIBUTORS

will supervise the sale and distribution of all Staley package, industrial and special products. Lyle H. York, with the firm since 1928, will manage the Cleveland office, and will be assisted by Jack Krause. Head of the Philadelphia office is H. J. Reavis, industrial sales representative since 1924. Assistant manager there is Harold Hiser.

Downingtown Mfg. Co.
has announced that a motion picture of the operation of the new Masson-Scott Cutter was to be shown at the June 21 meeting of the Maine-New Hampshire Section of Tappi.

Askania Regulator Co.,
Chicago, has announced the appointment of Heat & Control Inc., San Francisco, as its West Coast representative. The firm will handle the complete Askania line of hydraulic automatic control equipment.

A. O. Smith Corp.,
Milwaukee, has moved its welding equipment manufacturing facilities to larger quarters. In addition to providing additional space, the building also houses experimental shops and some sales offices. Space vacated at the Milwaukee Works is being utilized for expanded welding electrode production.

Reichhold Chemicals Inc.
has announced the establishment of a South Atlantic Division at Jacksonville, Fla. The move heralds the firm's entrance into the field of cellulose chemistry.

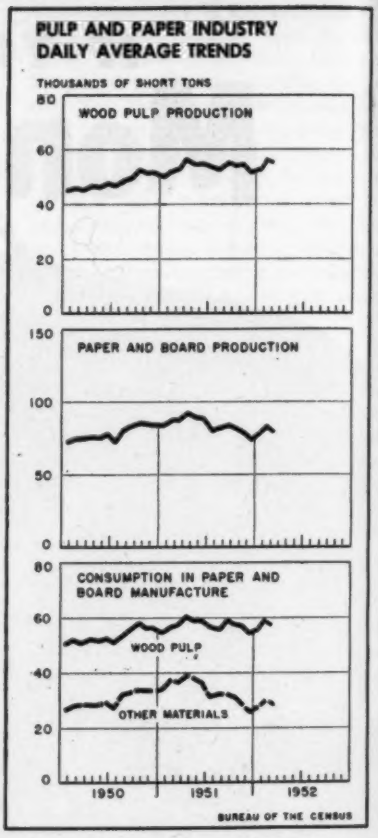
Babcock & Wilcox Co.
has moved its general offices in New York, N.Y., from 85 Liberty St. to new headquarters in the 32-story Chrysler Building East at 161 E. 42nd St. The firm will occupy approximately 120,000 square feet of space in the newly completed office structure. It employs about 825 in the New York office.

Sterling Electric Motors, Inc.,
has appointed the following additional distributors: Industrial Electrical Co., Modesto, Cal.; Butte Machinery Co., Butte, Mont.; Pomona Electrical Machinery Co., Inc., Pomona, Cal.; Industrial Motor Electric, Woodland, Cal.; Meyer Bros. Co., Phillipsburg, Pa., and Transmission Equipment Co., New York, N.Y.

U. S. Paper and Paperboard Production

	Mar. 1952 (tons)	Feb. 1952 (tons)	Mar. 1951 (tons)	Total 1951* (1,000 tons)	Total 1945 tons)
Paper and Board, total	2,072,358	2,004,695	2,373,064	26,086	17,371
Paper, total	993,980	954,192	1,008,655	11,622	7,574
Newsprint	96,371	88,792	92,483	1,106	725
Groundwood paper (uncoated)	71,826	71,529	67,411	789	636
Printing and converting (coated)	98,765	91,353	101,101	1,115	1,501[2]
Book papers (uncoated)	130,214	128,063	142,843	1,622	
Fine paper (writing, cover and text, bristols, thin paper and other)	124,286	122,133	115,661	1,364	1,001
Coarse paper (unbleached, kraft, glassine, greaseproof, vegetable parchment and other)	307,123	293,068	306,009	3,597	2,403
Special industrial paper	38,563	36,539	39,391	419	238
Sanitary paper	98,924	96,451	103,657	1,215	824
Tissue paper	17,255	16,611	27,322	270	157
Absorbent paper	10,653	9,653	12,777	124	89
Paperboard, total	871,109	848,193	1,099,459	11,605	7,907
Containerboard, total	462,367	448,850	594,541	6,347	4,131
Liners	315,229	303,385	389,937	4,205	
Corrugating material	125,456	121,509	172,515	1,815	
Container chip	21,682	23,956	32,089	328	
Bending board (folding boxboard)	255,885	247,637	334,254	2,429	2,092
Non-bending board (set-up boxboard)	65,106	61,023	80,515	701	721
Cardboard	5,496	5,877	7,379	79	71
All other paperboard	82,255	84,806	82,770	1,849[3]	891
Wet machine board	10,690	10,973	15,442	144	112
Construction paper and board, total	196,579	191,337	249,508	2,716	1,778
Building paper and insulation	101,932	93,843	137,979	1,401	883
Hardboard and insulating board	94,647	97,494	111,529	1,315	895

(*) Preliminary report. (1) Total for 1945, combining printing and converting paper and book paper. (2) The figure shown for "All other paperboard" (other bending board, other non-bending board, and special paperboard) does not include production during January 1951. This figure for January is 199,022 tons and is included in the "Paperboard" total. *Source: U. S. Department of Commerce.*



March Pulp, Paper and Board Production

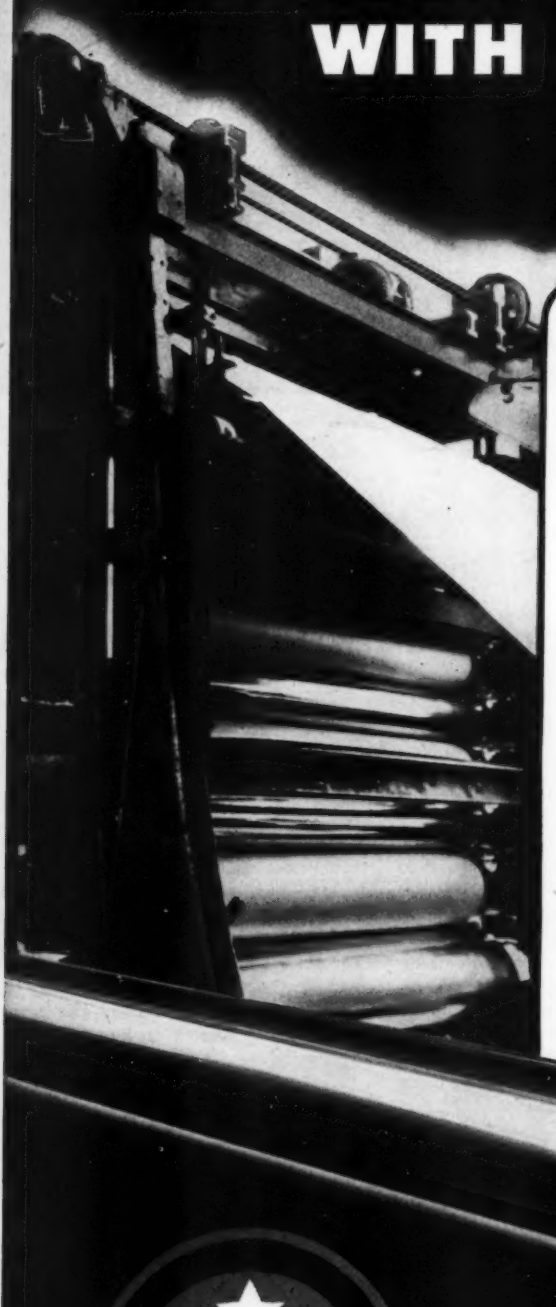
Paper and board production during March amounted to 2,072,358 tons, according to a report released by the Bureau of the Census. This is 13 per cent less than the tonnage produced in March a year ago. In terms of production base capacity, the industry operated at 75.9 per cent during the month, with the paper and paperboard sections operating at 86.3 and 69.1 per cent, respectively. The comparable ratios for February were: Total, 79.6 per cent; paper, 89.8 per cent, and paperboard, 72.9 per cent.

Pulpwood receipts at the pulp mills during March were 2,482,480 cords, with consumption at 2,331,538 cords. Month-end inventories increased 2 per cent to 5,914,773 cords.

Wood pulp production during March amounted to 1,449,740 tons. In terms of production base capacity, pulp production ran at 87.4 per cent, as compared to 89.6 per cent in February.

Wood pulp inventories at the end of March at the paper and board mills increased 6 per cent to 532,464 tons. Month-end stocks at the pulp mills increased from 103,835 tons to 112,168 tons.

CALENDER ROLLS WITH LONGER LIFE



MIDVALE
STAINLESS STEEL ROLLS OUTLAST ALL OTHERS

The reliability and long life of Midvale stainless steel rolls has been proved again in a large Eastern mill. On the same installation where regular rolls in the water box positions pitted and corroded badly . . . Midvale stainless steel rolls are still going strong.

Skill and experience of Midvale craftsmen assure rolls built to your most exacting specifications of hardness and finish. Modern equipment and quality control—from furnace to finished roll—produce rolls unsurpassed in performance . . . production-proved in America's leading mills.

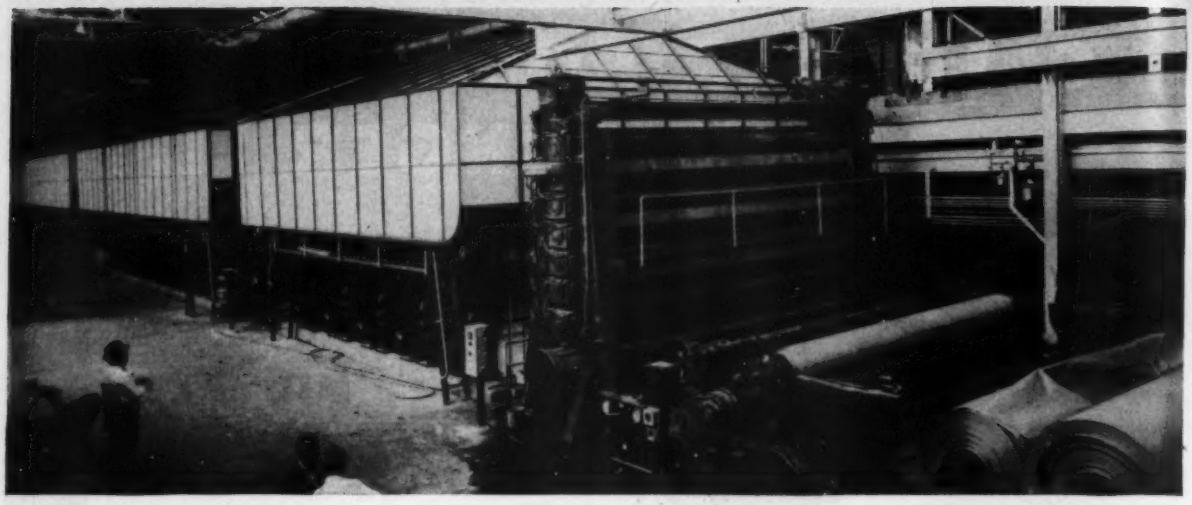
Throughout your operations—whether rolls or heavy duty forgings—you'll be certain of precision, performance and production with Midvale products.

THE MIDVALE COMPANY
NICETOWN, PHILADELPHIA 40, PENNA.
OFFICES: NEW YORK
CHICAGO, PITTSBURGH
WASHINGTON, CLEVELAND
SAN FRANCISCO

MIDVALE

Custom Steel Makers to Industry

PRODUCERS OF FORGINGS, ROLLS, RINGS, CORROSION AND HEAT RESISTING CASTINGS



Starch solution being applied to the sheet by a size press just ahead of the last section of driers

Research and experiment stimulate . . .

Expanded use of corn products in paper making

FLOYD A. LEWIS
Corn Industries Research Foundation

WITH A TOTAL CONSUMPTION of over half a billion pounds of corn starch, gum, and dextrin annually, the paper and paper products industry easily ranks as the number one nonfood industrial user of products made from corn, our greatest agricultural crop. A four-fold expansion in the use of corn starch by this industry has been registered in approximately the past ten years.

Much of this expansion stemmed from the development of machine-coating for high-quality papers, which has stimulated a tremendous growth in coated paper production. The substitution of paper in many products for other materials, such as lumber, glass, metals and textiles, has been another strong contributing factor. An increase in the production of all types of paper and paperboard containers also accounted for part of the expansion, since most of the adhesives used in manufacturing these products utilize a corn starch or dextrin base.

During 1950, for example, paper mills and paper box manufacturers in the United States used 376,446,133 pounds of corn starch, whereas in 1940 they used only 106,493,893 pounds. (An increase of some 100,000,000 pounds annually occurred in 1941-42 alone, when the war drastically curtailed the supply of tapioca; this represents a permanent gain in the use of corn starch by the paper industry.) Adhesives required for the manufacture of laminated and corrugated paper products accounted for 145,546,859 pounds in 1950, and an additional 55,529,952 pounds went into paste, adhesive, and dextrin manufacture. Most of the latter was used in the manufacture of paper products, and in addition some of the dextrin made by the corn refiners was sold directly to paper mills. The total consumption of corn products by the paper and paper products industry in 1950 thus was well over a half billion pounds.

A prominent paper manufacturer cites four principal reasons for the extensive use of corn products by this industry: year-round availability, stability of price, dependable quality, and the corn refining industry's extensive research.

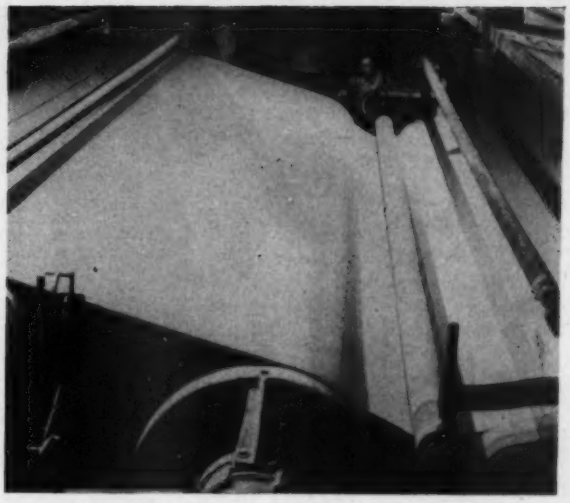
Availability and price stability are closely related factors. Shelled corn is easily stored without appreciable depreciation, so that full production of corn products may be maintained from one harvest to the next. Although the corn refining industry is now producing more than four billion pounds of starch annually, it processes only a small percentage of the total corn crop. The industry thus has a raw materials base of great stability. The same factors permit the industry to maintain stability in the pricing of its products.

Like the first two factors cited, the latter two also are related. The extensive research carried on by the corn refining industry, both by individual companies and cooperatively, has contributed toward both maintained uniformity of product and the development of new products. An outstanding example of cooperative research is the program sponsored by the Corn Industries Research Foundation. Although aimed at such high-level problems as determining the basic nature of the starch molecule, this program has contributed substantially toward the development of new and improved products better adapted to meet the needs of users. One example is the development of so-called "waxy" corn. Starches made from this variety exhibit greater adhesiveness than those made from ordinary hybrid corn and possess other desirable characteristics for certain purposes. This development is still far from complete, but already it is yielding important results.

In addition to the four principal fac-

Photographs used in this article are through the courtesy of the following firms: Champion Paper & Fibre Co., Dilts Machine Works, Frank W. Egan & Co., John Waldron Corp., Pusey & Jones Corp., S. D. Warren Co., and Union Bag & Paper Corp.

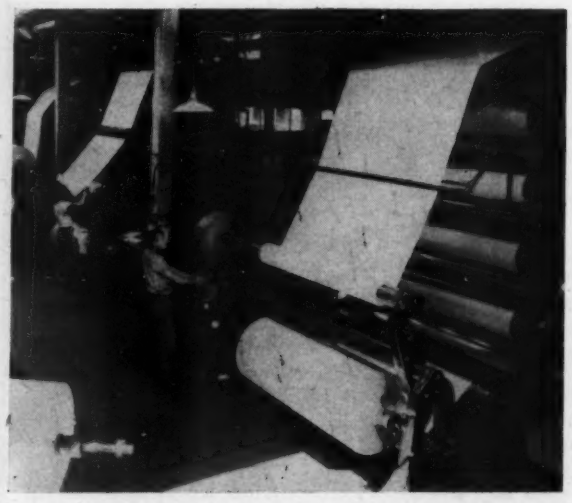
Corn starch sizing is often introduced at an early stage in paper manufacture, such as in the beater room



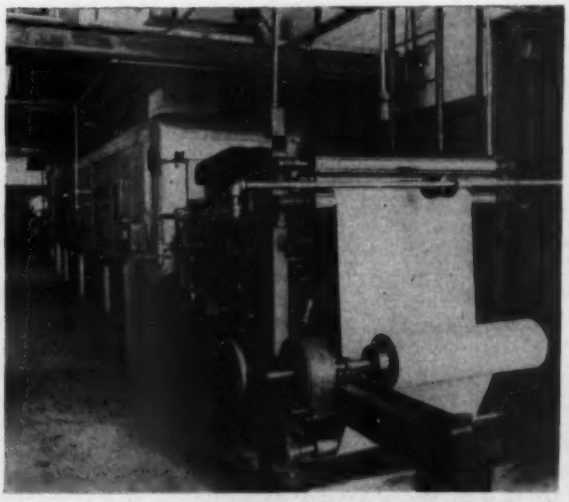
Sheet enters press-roll section from the wire; here corn starch beater sizes help bond pulp fibers together

Size press installation for application of size solution to both sides of the sheet as it leaves drying section

Coating room, where coatings containing corn starch binder are applied to either one or both sides of the sheet

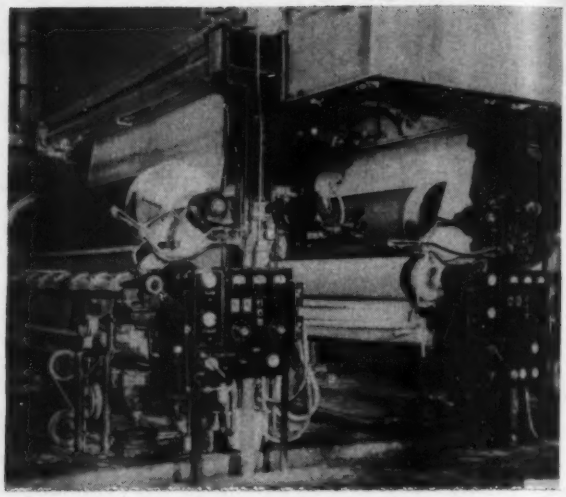


Calender room, where rolls of coated and supercalendered paper are passed through the calender stacks



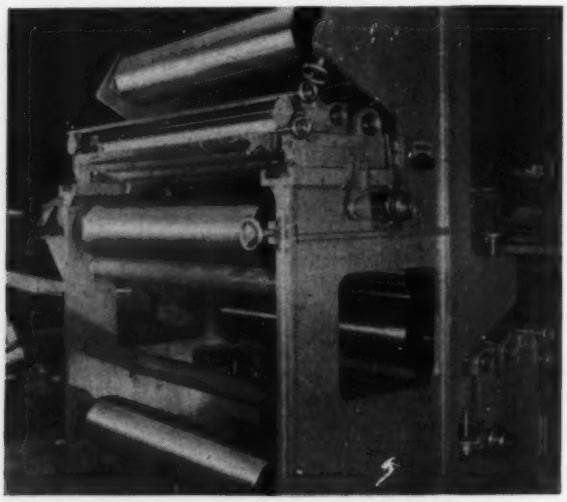
Paper roll coating machine of the type used for research and experimentation in modern laboratories

Excess coating shaved from the surface by "air knife," which directs a narrow jet longitudinally along sheet

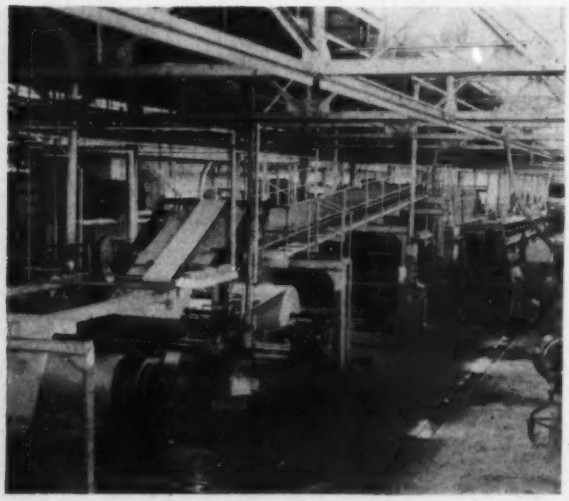


Two-side "Syncroset" coater installed on machine of New York & Pennsylvania Co. at Lock Haven, Pa.

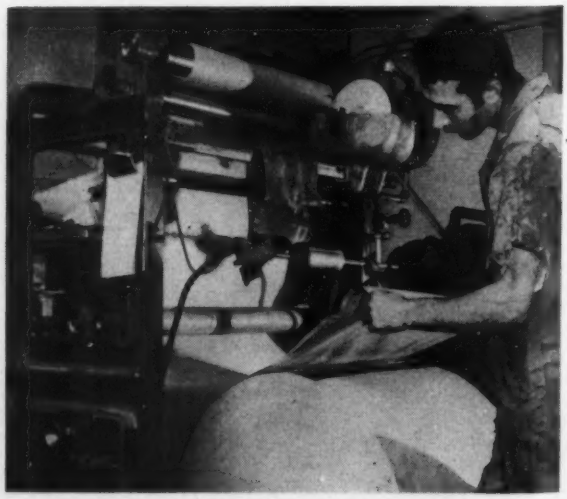
Typical paperboard laminator of the type employing starch adhesives; equipment here by Dilts Machine Works



Dual applicating head (front view) by Dilts used in a three-ply paperboard laminator



Corrugator producing double-faced board; adhesive is applied by the unit just to the right of center



Bag-making machine; adhesive is applied to the sheet by the small disk at the upper right

tors cited. corn starch is white—the same color as most of the paper in which it is used. It is odorless and is not adversely affected by the rapid high-temperature drying employed in paper mills. When the mills began using corn starch they did not need to alter their drying-drum setup.

Four principal uses

There are four principal uses of corn starch in the paper and paper products industry. First, corn starch is added to the pulp, usually at the beaters before the paper sheet or board is actually formed. Second, it is applied as a surface size to the formed sheet. Third, it is used as a binder material for the clay or pigment coatings that are applied to high-quality papers.

Adhesives constitute the fourth major application. While many different types of adhesives are in use today for joining different materials, corn starch and dextrins and gums made from this starch are the most widely used in the manufacture of paper products.

Not all papers require sizing. Newsprint is the most notable exception, others being tissue and blotting papers. The majority of other papers and paperboard, however, require the strength, toughness and resistance to scuffing and folding that starch additives provide. Since starch has the same basic chemical composition as cellulose, the principal constituent of paper, it is perhaps natural that starch should be used for this purpose.

Because large quantities of water are required in the manufacture of paper, and smaller amounts in the production of the necessary steam and power, the use of starch for water treatment may be of interest. A number of patented compounds have been introduced containing starch and certain other chemicals which may be introduced directly into boiler feed water to reduce hardness. Others are available for clarification of muddy water when this must be used for industrial purposes, in which case the starch aids in precipitating the solid matter. Some also are used for the clarification of industrial waste waters and in the recovery of solids from these wastes.

Minor amounts of other corn products are used by the paper industry, such as corn syrup in the manufacture of glassine paper and sulphonated corn oil as a minor dispersing agent or plasticizer. Sodium lactate and corn syrup also are employed for the latter purpose.

Beater additives

Starches used in the initial stage of paper manufacture are usually referred to as "beater additives," although they may be added either in the beater or at the fan pump after the refining engines. Pregelatinized, raw, and treated starches are employed.

Dry pregelatinized starch is added at the beater, where it swells to an intermediate degree. Complete dispersion is accomplished when it passes through the refiners on the way to the paper machine.

Raw or treated starches when used in the beater are generally first pregelatinized by cooking. The resulting dispersion is more thorough, but some adhesive character and bonding strength are lost when subjected to the severe mechanical action of the refining engines. In some cases, such as in the manufacture of paperboard, raw or treated starches are added to the beater dry. The heat and moisture present when the sheet is being dried are relied on to gel the starch within the paper or board itself.

Some mills add the starch at the fan pump or near the head box to avoid the mechanical degradation that takes place when the starch is added at the beaters. Oxidized starches, raw starch, "causticburst" starch, or a soap-starch complex may be added in this way. Cooking is generally required to gelatinize the starch, although caustic may be used to swell and burst the starch granules at a low temperature. The presence of the caustic (soda ash) also aids in the retention of the starch in the fibers. Another method of improving the retention of the starch is to react the starch with soap.

Little is known about the mechanism by which starch is retained with the fibers on the paper machine wire. The starch-cellulose bond is receiving much attention from both paper and starch chemists who are trying to find an improved starch for wet end use and a better method of retaining the added starch.

Starch sizes

Corn starches are employed extensively in both calender and tub sizing. The former is used mostly on paperboard to improve the surface and lay loose fuzz, and the latter primarily on the higher grades of paper.

Although various types of starches are used by different mills, buffered pearl and chlorinated starches are the kinds most commonly employed. Many mills now prepare their own treated starches by enzyme conversion, and buffered pearl starch was developed to meet their needs. It is simply raw starch treated to adjust its acidity to near neutral so as to facilitate the enzyme action. Most of the mills not equipped for enzyme conversion use chlorinated starches for sizing. Dextrins and a variety of specialty starches also are used, depending on the type of sheet or board being made.

In calender sizing about 80 per cent of the corn starch used is of the chlorinated variety, with enzyme-converted starch and dextrin making up most of the balance. Raw starch sometimes is employed for light application, but the heavier applications require the use of treated starches. Highly modified starches have characteristics that make them more suitable for some types of paper, while less highly modified starches are better for other types. Some compromise is often necessary. Sizes of high fluidity will increase the bursting strength of a sheet because of their deeper penetration. Waxes or other ingredients are added to the size to obtain special applicative characteristics.

Both animal glue and various types of starches are used for tub sizing. In some cases mixtures of glue and starch are employed. A size of low viscosity sometimes is required to give the sheet the desired characteristics.

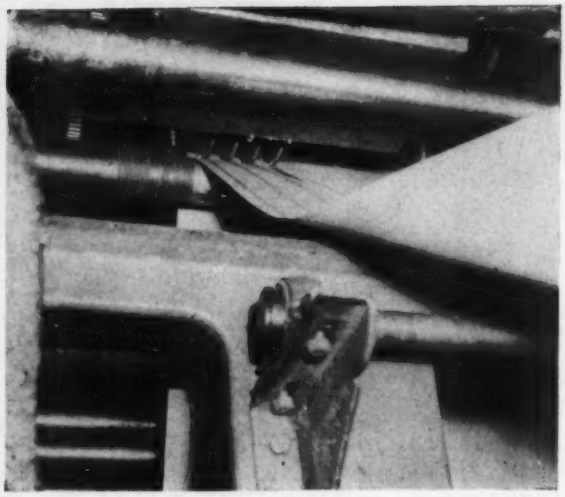
Research on tub sizes has shown that best results are obtained with a highly modified starch; enzyme-treated and chlorinated corn starches and torrefaction dextrins (produced by roasting starch) are all widely used in this operation. For reasons of economy, the use of enzyme-treated corn starches for tub sizes has increased considerably in recent years.

The foregoing discussion applies generally to the production of high-grade papers and paperboards, especially those intended for printing. Other types sometimes involve special considerations and requirements. Greaseproof papers — glassine and vegetable parchment — are good examples.

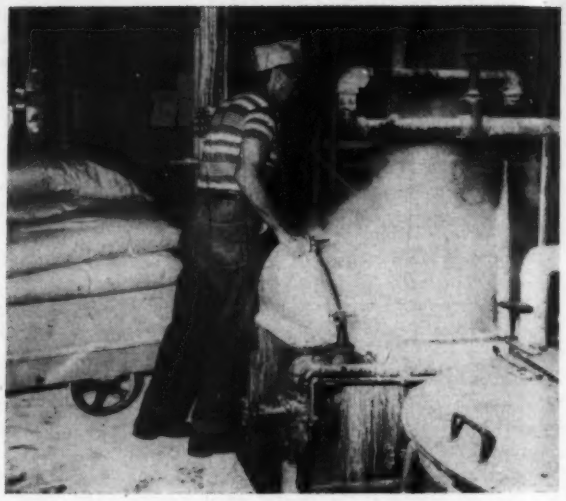
When glassine is being made, the pulp is usually refined to a great extent so that it becomes highly hydrated and the fibers are cut short. A starch additive that will withstand this degree of refining is desired here. The formed sheet is later tub-sized to make it impervious, and here a starch size having good film-forming characteristics is used. Vegetable parchment is treated in a sulphuric acid bath to give it the desired grease-resistant surface, after which it is tub-sized like glassine.

Starch sizing is used to only a limited extent in kraft paper, but the increased strength and other improvements possible in this product by sizing indicate an increased use of starch in kraft in the future.

Corrugated board for cartons and other uses is another product in which an increased use of starch is probable. Consumers are demanding multicolored cartons in larger numbers so that an increasing proportion of the board used



Machine for making bags, where four disks apply adhesives to four sheets of paper simultaneously



Pearl starch being dumped into paste cooker in preparation for its use in making paper bags

in this product will be calender-sized. Efforts to increase the crush resistance of the corrugating medium are leading to the development of improved starch sizings for this element.

Coatings

Not too many years ago paper manufacturers felt that only animal glue or casein was suitable for the preparation of paper coatings. The continuing research by both the paper industry and the corn refining industry, however, has produced modified starches suitable for all types of paper coating operations. Today corn starch sizes are used in producing the finest coated papers. Economy is a big factor here, treated corn starches being available at stable low cost as compared with the higher and highly unstable prices that have been characteristic of casein.

Paper coatings are applied for a variety of purposes—to improve the printing surface and color, add weight, provide water resistance, or impart other special characteristics. Colored pigments are sometimes added to the coating mixture, which is called "color" by the paper industry whether or not it includes colored pigment. The majority of coatings consists largely of clay or other filler material plus the sizing material to bind the filler to the sheet. Papers are produced with either one or both sides coated, depending on their intended use. For better printing surfaces, the coatings are calendered.

Several methods of applying the coatings are in common use. Most of the processes, however, involve passing the sheet between applicator rolls immersed in a coating box. These rolls may be adjusted to apply sufficient coating color to impart the desired weight to the sheet. After the color has been applied, it must be smoothed out to uniform thickness so that the final dried sheet will have uniform weight. In some instances the freshly coated sheet is passed through a series of brushes extending across the sheet, which smooths out the coating as the sheet is drawn through. In some mills, these brushes have been replaced by highly polished metal rolls. In other machines, an "air knife" is employed. In machines of this type the coated sheet is drawn past a long nozzle extending across the width of the sheet and containing a narrow opening throughout its entire length. Air under pressure is forced out through this nozzle, producing a knife-like jet which is so directed across the sheet that it literally "shaves" the excess color from the surface. In some instances both the "air knife" and smoothing rolls are employed.

After the coating has been smoothed out, the sheet must be carefully dried. Where both sides of the sheet have been coated, the drying is accomplished by drawing the sheet through a long tunnel in which the sheet is supported from any direct contact with any part of the machine by a series of air jets. From this initial drying section the sheet passes into another chamber through which it is carried in large loops.

The machine coating of paper imposes severe requirements on the coating color. The color must have a relatively low water content in order that drying may be completed at reasonably high operatig speeds. To put it another way, the color must have a relatively high solids content. At the same time, it must have a viscosity low enough so that it can be handled properly by the applicator rolls and pumping system. To meet there requirements various modified starches are employed. Chlorinated starches, dextrins, and enzyme-treated starches are all widely used in paper coatings, depending on the requirements of the coating equipment in use and the end result desired.

Coating colors containing up to 67 per cent solids are now in successful use in high-speed coating machines. About 17-18 per cent of the solid material is starch, which is enough to give the desired strength.

The flow properties of coatings with from 60 to 67 per cent solids must be carefully considered in order to use them properly and with optimum results. A compound such as tetrasodium pyrophosphate is used to disperse the pigment and lower the viscosity of the high-solids mixture. With a well dispersed pigment, it is possible to use dextrins, oxidized or chlorinated starches, and enzyme-converted starches that are less converted and have a higher adhesive strength. Other materials are sometimes added to reduce the viscosities and in some cases to alter the flow properties of high-solids coatings. Some of these additives will thicken or "bulk up" the color while providing the desired rheological properties.

In the preparation of high-solids coatings, dry clay may be added to the cooked starch paste in a heavy duty mixer. Other materials may be added as required. When all the materials are in, the color is agitated thoroughly to obtain a homogenous mixture and to stabilize its flow characteristics as much as possible. Sometimes raw starch is added to the clay dispersion and converted with enzymes in the presence of the clay.

When resistance to water is required, as in coated papers for offset printing, water-resistant materials are introduced into the color. Water-soluble compounds of urea and formaldehyde or melamine and formaldehyde give good results. Acid and heat accelerate the ac-

tion in starch-resin coatings, but both must be held within limits or deterioration of the paper will result. Therefore, resin coatings usually are formulated under conditions of low acidity, and an acid catalyst such as ammonium chloride, oxalate, or phosphate is added just before application. A resin content of 15 to 30 percent, based on the starch content, is sufficient for most purposes.

Adhesives

Although adhesive materials of various types have been used for centuries in the manufacture of many types of products, it is only in comparatively recent years that the theory of adhesives has been under close scrutiny. Research in adhesives has followed the extensive research on corn starches so that today an increasing number of adhesive needs are being met by these materials.

Different types of starches are used to meet various adhesive requirements. For example, envelopes require one type, corrugated board another, and a still different type is needed in the manufacture of that board into cartons. The type of adhesive used for any particular product depends partly on the method of application; that is, whether by rolls, wheels, sprays, brushes, or other means. Small quantities of various chemicals, such as borax, urea, wetting agents, plasticizers, defoamers, and preservatives, may be added to the adhesive to impart special characteristics. For maximum efficiency and minimum cost, all factors influencing the operation must be thoroughly coordinated.

Most of the adhesive bases made from corn starch are either canary dextrins (high solubility in water), white dextrins (low solubility), or British gums (high or low solubility). To a lesser extent modified starches are used, such as the thin-boiling, oxidized, and enzyme-treated types.

Unmodified corn starch also is required in some adhesive applications, in which case some means of gelatinizing the starch in order to develop its adhesive properties must be employed. Perhaps the best known method of doing this is that known as gelatinization *in situ*, in which the starch is gelatinized by heat after being applied.

One of the most outstanding applications of this method is found in the manufacture of corrugated board. First, the corrugated liner is formed, after which the adhesive, which usually consists of a simple starch slurry with small amounts of certain chemicals added, is applied to one side. Actually, the adhesive is applied only to the tops of the corrugations. Plain board is then pressed into contact with the core, and heat is applied to gelatinize the starch, which develops its adhesive properties. For a single-faced board, this completes the operation. Where double-faced board is being made, the process is repeated on the other side of the core. Special machinery has been developed to perform both operations.

The adhesive for this application usually consists of ungelatinized starch suspended in an aqueous solution of gelatinized starch. This solution must have sufficient viscosity to keep the raw starch in suspension and cause the adhesive to be picked up and transferred onto the applicator rolls. The ungelatinized starch should comprise at least 15 per cent of the solids in the adhesive, since it is this portion of the mixture which actually produces the bond when heat is applied. A small percentage of sodium hydroxide is added to lower the gelatinizing temperature, and borax is also added to increase the viscosity of the starch when it becomes gelatinized.

Envelopes comprise another type of paper product requiring large quantities of adhesives. In the past, tapioca dextrins have been used almost entirely for envelope gums. In recent years, however, research has brought corn starches prominently into the picture. Dextrins produced from both waxy and ordinary corn have been used successfully as envelope adhesives.

Two different types of adhesives are required, one for the seams and one for the seal. The seal gum must be nontoxic and free from unpleasant taste and odor. As envelopes are manufactured on high-speed machines, rapid drying of the seal gum is a requisite. Therefore, a canary dextrin having high solubility is used so that the adhesive may be a highly concentrated dispersion. The adhesive should not "cotton" (leave trailing fibers following the machine pickers) or "sugar" (particles of adhesive thrown off gumming rolls onto paper). Adding a small amount of starch to the adhesive mixture will minimize cottoning, and maintaining the viscosity within the desired limits will control sugaring.

To prevent undue curling of the seal, a small amount of plasticizer, such as glycerol or diethylene glycol, is used. A common practice in preparing the seal adhesive is to mix the gum with water at a concentration of about 65 per cent solids and heat with agitation for about 45 minutes; the plasticizer then may be added.

Adhesives for envelope seams must meet somewhat different requirements. Slower drying is desirable so that the seams will set without developing strains in the paper. At the same time, the seams must remain flat which means that a highly plasticized adhesive is required. A light color is desirable so that the adhesive will not discolor the paper.

In the past, sugar-plasticized gums have generally been used for envelope seam adhesives. These have been prepared by heating the dextrin-sugar mixture in an acetic acid solution. The purpose of the acid is to invert the sugar, which then serves as the plasticizing agent. The disadvantages of the sugar-acid plasticizer have led to the use of urea as the plasticizing agent. Dispersions of dextrin with from 30 to 50 per cent urea are prepared by heating at temperatures of from 140 to 150F. These adhesives are formulated so as to contain from 70 to 75 per cent solids.

Adhesives used for gummed paper, labels, stamps, and stickers in general must meet the same requirements as envelope seal gums. Generally, however, a less concentrated mixture (about 50 per cent solids) having lower viscosity is used, and the paper usually is dried by passing it through heated tunnels.

Several types of adhesives are employed to meet the diversified requirements of the many different types of paper bags now being made. In the first place, bags are made of many types of paper ranging from textured stock to waxed and water-resistant types. As a rule, different adhesives will be required for the seams and for forming the bottom seals.

Since bag-making is a high-speed operation, the machine characteristics will dictate to some extent the adhesive properties required, as in the manufacture of envelopes. The adhesive must neither spatter nor string; it must set within the permissible time limit, and of course it must form a strong bond. The newer machines which form a complete bag in one operation impose more severe requirements than those which form the seams and bottom seals separately, faster setting adhesives being required.

In general, the various types of dextrins and British gums made from corn starch will meet all of the varying requirements for bag adhesives. The mixtures ordinarily will vary from one part dextrin or gum and one part water to one part dextrin and five parts water. Some require heating in their preparation, and others do not. Suitable wetting agents or other chemicals are added as required.

The manufacture of paper and cardboard boxes is another field where the requirements vary widely. Both the type of paper and cardboard and the method of manufacture will influence the adhesive requirements. For hand or slow machine operation, an adhesive of low solids content will do the job. For high-speed machine production, which is the method used for most of the box manufacturing today, a more concentrated adhesive is needed. The adhesive must spread evenly and develop a quick tack, as otherwise the overwrap may spring

back as soon as the box leaves the machine. At the same time it must not set too rapidly or blisters may develop. In most cases, an adhesive of from 40 to 50 per cent solids content will prove satisfactory.

The large quantities of boxes and cartons required for shipping military supplies abroad during World War II, generally referred to as V-board boxes, spurred the development of water-resistant corn starch adhesives. Today's requirements for renewed overseas shipment of large quantities of war material has again focused major attention on adhesives of this type.

Best results have been obtained with a starch base adhesive containing urea formaldehyde resins. Where the method of gelatinization *in situ* (thermal setting of adhesives) is employed, unmodified starch may form the adhesives base. For other processes, a dextrinized starch is employed. A small quantity of an acid salt is usually added to control the acidity within required limits.

Paper drinking cups and food containers are still another class of product in which corn starch adhesives play a vital role. These units are made by high-speed machines, and the joints must be resistant to water, fats, and in some instances, alcohol. The adhesives used are somewhat similar to manufacture of boxes and cartons for overseas cargo.

Paper milk containers impose additional requirements. Not only must the adhesives be resistant to water, fat and lactic acid, but they must also be non-toxic and odor-free. In addition, they must be adaptable to the rapid assembly and filling operations employed. These containers are formed, sealed, wax-dipped, filled, and closed in rapid succession, all in one continuous operation. Specially formulated starch-resin adhesives successfully meet these difficult requirements.

These are but a few of the multitudinous paper and paperboard products being manufactured today in which corn starch adhesives are being successfully employed. But enough have been cited to demonstrate clearly that corn products are as essential to the manufacture of paper products today as to the production of the paper itself.

References

1. "Chemistry and Industry of Starch" (second edition), Ralph W. Kerr. Academic Press Inc., New York, 1950.
2. "Starch for Paper Coating," TAPPI Monograph Series—N. 3, Technical Association of the Pulp and Paper Industry, New York, 1947.

Improvements at Covington as . . .

Westvaco completes modernization project

West Virginia Pulp & Paper Co.'s broad postwar rehabilitation program at the Covington, Va., mill has moved forward another step with plant crews completing work on a $1,500,000 improvement project in the paper mill.

The project covers the rebuilding of No. 6 and No. 7 paper machines, the remodeling and rearrangement of the stock preparation layout and realignment and modernization of rewinding and roll finishing operations serving these machines, and construction of an addition to the machine room to accommodate the new streamlined operations.

Completion of the major phases of this immediate program was marked by the start-up of No. 7 paper machine, a prime producer of important grades of paper made at Covington, which had been shut down for almost two weeks while new parts and units were being added to its 224-foot frame.

Plant officials pointed out that these improvements, like others carried out since the end of the war, are designed primarily to improve the quality and uniformity of the product, to effect economies through more efficient operations, and to maintain the greatest degree of flexibility possible for a mass production mill. No material boost in production is expected for some time.

Current paper mill improvements represent the fourth phase of an extensive rehabilitation program designed to restore the Covington mill to the competitive position it enjoyed during the 1920s. Since the war, the company has spent in the neighborhood of $30,000,000 in Covington and has allocated several millions more for future projects already authorized.

Some phases completed

Major improvements already effected or in the final stages of completion include fuller mechanization of the pine and hardwood yards, the rebuilding and consolidation of the plant's pulp mills to permit freer use of the abundant hardwoods in this area and reduce the quantity of scarcer pine wood used in pulp manufacture, and the rebuilding of No. 5 paper machine, the top producer of the seven machines now operated at Covington.

Work is also nearing completion on certain phases of a modernization program for the recovery department, where chemicals from waste pulping liquors are recovered and processed for re-use. This includes the rebuilding of one rotary furnace used for liquor burning, placed in operation this week; installation of a new modern causticizing plant, complete with a 350-foot lime kiln capable of producing as much as 275 tons of lime per day, and installation of an additional sextuple-effect evaporator used to concentrate waste liquors prior to the burning process.

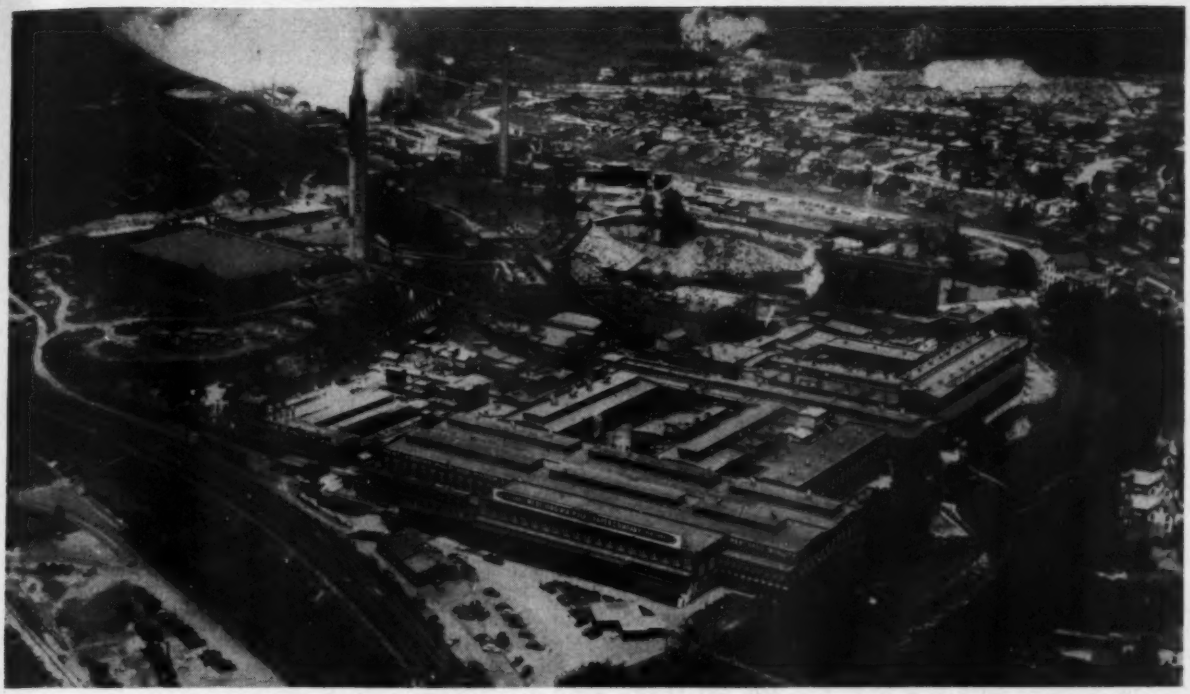
The next major project on the schedule is installation of a completely new paper machine, to be designated as No. 8. This machine, which will be built on the sites now occupied by No. 3 and 4 machines, will replace older, inefficient paper-producing equipment. The machine will have a 216-inch wire and will measure 430 feet from the headbox to the reel. Preliminary work on this project already has begun, but the actual installation of the machine is not scheduled until late fall.

Machine improvements

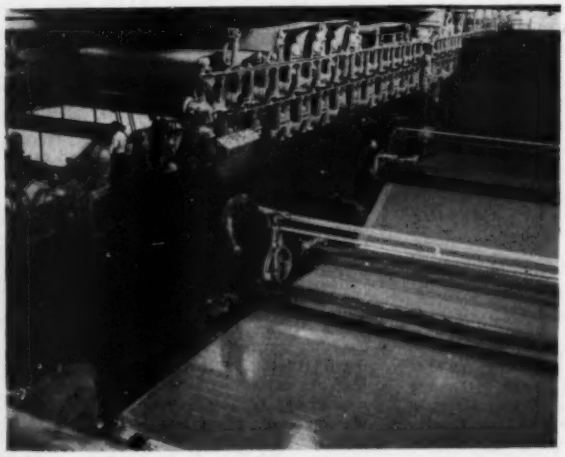
Projects related to the rebuilding of No. 6 and No. 7 machines required months of precision engineering and technical planning. In addition, many weeks of work to prepare auxiliary operations for the change, and weeks of preliminary work at the site—installing electric and steam connections, pouring new foundations, assembling larger units as they were received from the manufacturers, and moving these and smaller units to the site—were necessary before actual work on the machines began.

Working round the clock, plant construction and maintenance crews, assisted by members of the machine crews and representatives of suppliers who manufactured the major units for the machines, managed to rebuild each of the machines in less than two weeks.

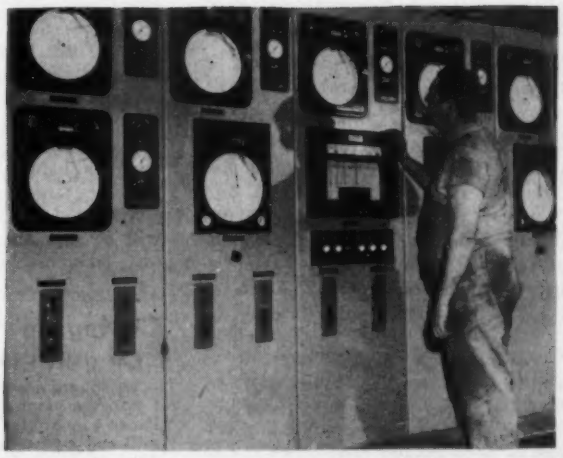
In order to carry out the tandem job



Aerial view of the Covington, Va., plant of West Virginia Pulp & Paper Co.



No. 6 and No. 7 paper machines, which were rebuilt recently



Stock metering equipment at Westvaco is completely instrumented

with a minimum of production losses, the crews first completed necessary shifts in the stock preparation layout required for the rebuilt machines. This called for extensive rearrangement of the beater room. New stock proportioners—compact, precision-controlled pulp-furnishing installations—replaced continuous mixers and thickeners which had been used for over 25 years. The new Trimbey Machine Works stock metering units are operated by Mason-Neilan Regulator Co. push-button controls, are equipped with electrical devices to chart the exact flow of different types of pulp needed to make up the furnish for a particular grade of paper, and automatically control the flow in relation to the production requirements of the paper machine.

New machine room

While both machines maintained full production, the crews also relocated six Jordans on the main beater room floor to serve No. 6 machine, installed three large refiners manufactured by Sutherland Refiner Corp. to serve No. 7 machine, and relocated two smaller ones for future service to No. 8 machine.

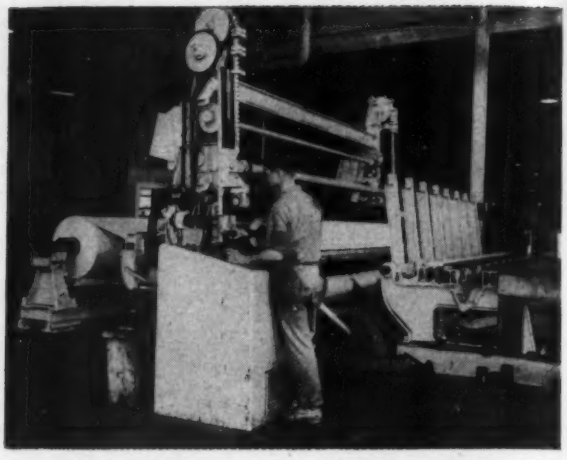
At the same time, construction crews were clearing the south end of the finishing and loading department and were erecting in their place an addition to the machine room. This brick and steel extension, measuring 80 feet in width, 96 feet in length, 28 feet in height, was completed in 15 weeks.

The preliminary work ended, No. 6 machine was shut down February 17, and its production of nine-point board was shifted to No. 7 machine, while the order pattern of the other five machines was altered to make up part of No. 7's production.

No. 6 machine was rebuilt in 11 days, renewing operations February 28. After a shakedown, the machine began producing a uniform, good quality board at the volume anticipated for initial operations. Then No. 7 was shut down. Work on this machine was completed in 13 days. Plant officials said it would be several months, however, before the two machines would reach top operating efficiency.

The wet ends of both machines were improved substantially by the installation of Stebbins Engineering & Mfg. Co.

Trimbey stock metering equipment installed ahead of both rebuilt paper machines



Two Cameron rewinders rebuilt and relocated immediately behind Nos. 6 and 7 machines

tile-lined stock chests equipped with Improved Paper Machinery Corp. constant agitation devices and new Beloit Iron Works flow eveners and pressure-vacuum flowboxes, equipped with exacting controls to regulate the flow of pulp onto the machine's wires. In addition, a modern Rice Barton Corp. dual press was installed in the fourdrinier section of No. 7 machine, replacing two older single press units.

Dryers

The drying capacity of both machines was increased. A new hot air blowing system to reduce moisture content was installed in No. 6's dryer section, and four big steel drying cylinders, measuring 60 inches in diameter, were added, giving that machine a total of 50 paper dryers. Six cylindrical dryers of the same size and five additional felt dryers were added to No. 7 machine, which now has a total of 43 paper dryers and 10 felt dryers. This equipment is by Rice Barton.

A new and improved ventilating system of hood exhaust fans by J. O. Ross Engineering Corp., was installed for both machines, which not only will improve their operating efficiency but will improve working conditions for the crew members, particularly during the hot summer months.

The rewinding and roll finishing operations of both machines, previously carried out as a separate function, have been streamlined and relocated to provide straight-line operations directly behind the two machines. Rewinders from the finishing room were moved for that purpose. The area is equipped with new electrically driven overhead cranes to facilitate the handling of rolls from the reels of the machines to the rewinders.

The two rewinders were rebuilt and are equipped with a number of labor-saving devices by Cameron Machine Co., which eliminate many time-consuming and laborious manual operations. Among the new devices on the machines are pneumatic slitters, J. O. Ross pneumatic blowers which carry the roll trim directly to the broke beaters, mechanized Beloit shaft pullers, and removing gates and roll kickers which automatically move the heavy rolls from the rewinders onto the finishing tables.

One phase of the current paper mill improvement project not yet completed is the reactivation of the No. 6 and 7 cutting and sheet finishing operation, which was shut down in 1947. When this work is completed the new department will handle these operations for all machines, and the equipment in No. 2 cutting and sheet finishing department will be dismantled to make room for installation of No. 8 paper machine.

Covington's first half century

Beginning its operations in 1900, the Covington plant of West Virginia Pulp & Paper Co. originally consisted of a pulp mill and a paper mill with two machines. The rated capacity in the early days was an annual 15,000 tons of pulp and 7,500 tons of paper. A yearly payroll of about $115,000 went to some 300 employees.

Today the mill is one of the largest producers of paper and paperboard in the South, boasting two large pulp mills, a paper mill with seven paper and three board machines, and a variety of installations for the manufacture of chemicals. Its yearly output amounts to more than 200,000 tons of paper and paperboard. About 2,300 persons are employed, and the annual payroll runs about $8,400,000.

Covington operates its own power plant, which consumes more than 313,000 tons of coal per year, and its own water plant, which pumps about 15 billion gallons of water annually.

In 1952 the plant purchased more than $6,200,000 worth of pulpwood, both hard and soft. Most of it came from the forests of Virginia and the Appalachian region generally. In addition to this basic raw material, last year's operations required 967,000 gallons of oil, 309,000 tons of coal, more than 1 billion cubic feet of natural gas, and over 100,000 tons of chemicals used in the manufacture of pulp, paper, and allied products. Chemicals included the following: more than 19,600 tons of limestone, 19,000 tons of lime, 7,500 tons of salt cake, 7,600 tons of acid, 4,300 tons of clay, and 7,000 tons of salt.

Paper and paperboard made at Covington is converted into hundreds of different products, including white paper for books, magazines, general printing use, stationery, sales books and business forms, adding machine tapes, liners for tobacco cans and cigarette packages, display papers, doilies and shelf paper, school tablets, file folders, and tags; kraft paper for many kinds of envelopes, bags, creped papers, waved papers, and gummed tape; light paperboard for drinking cups, milk bottles and caps, butter cartons, ice cream cartons and cylindrical cans for packaging all types of frozen foods and hot drinks; heavy paperboard for shipping containers of all types, and dense fiberboard for use in the manufacture of shoes, luggage, goggle cases, football shoulder pads, waste baskets, and many other products.

Other products manufactured at Covington include activated carbon, used for the purification of water supplies, improvement of foods and beverages, and treatment of drugs and pharmaceuticals; calcium carbonate, used in tooth pastes, paints, rubber, salt, cosmetics, antacid tablets, and alkalizers; tall oil, used in paints, asphalt emulsions, soaps, core binders, rubber, linoleum, printing inks, insecticides and herbicides, and Polycel, a wood cellulose product used as a filtration agent in oils, beverages and other liquids, and as a filter in rubber and plastics.

Laying the foundation for further consolidation in the future, with room for increased capacity, the Covington plant has already expended more than $10,000,000 on a number of major adjustments since World War II. In addition, in 1950 at a cost of more than $2,000,000 one of the paper machines was almost completely rebuilt to meet mounting competition in the paper market. This particular machine can now produce about 150 tons of paper daily, compared to its previous daily output of 75 to 80 tons.

Covington is one of six mills owned by West Virginia Pulp & Paper. The others are located at Luke, Md.; Tyrone, Pa.; Williamsburg, Pa.; Mechanicsville, N. Y., and Charleston, S. C.

Reducing drainage time with . . .

An accelerated freeness test for slow stock

RAYMOND E. TAYLOR*
and D. S. DAVIS
Virginia Polytechnic Institute

THE FREENESS TEST is one of the most interesting and controversial in the paper industry. Probably more words, good and bad, have been written about it than about any of the other tests so necessary for adequate technical control.

One of the best testers is the Williams Precision, but for extremely slow stocks an excessive period of time is required to complete the determination. In this brief paper we show how the drainage time can be cut to one-sixth the usual value through correlation of the 500-ml. value with the 1000-ml. reading. In addition, we show that the familiar equation for box filters holds for sedimentation in the freeness tester during the latter half of the drainage period and suggest use of the slope of the head-time line on semilogarithmic paper as a measure of freeness.

Users of the Williams Precision freeness tester are well aware that the freeness value or the time in seconds required for 1000 ml. of water to drain from the

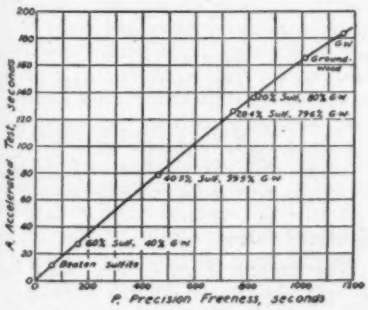


Figure 1

fiber mat while it is forming is disconcertingly large for slow stocks. For instance, thoroughly beaten sulphite pulp, bookstock, and repulped paper exhibit freeness values of 240 sec. (4 min.), and groundwood shows a freeness of 1200 sec. (20 min.).

To satisfy the evident need for an

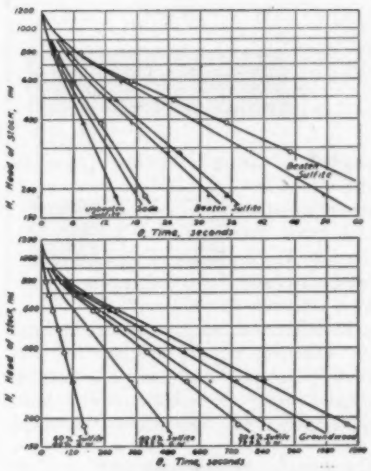


Figure 2

accelerated freeness test, sedimentation studies of beaten sulphite, unbeaten sulphite, soda, sulphite-groundwood mixtures and groundwood pulps were made in the Precision tester at the standard sample weight and temperature previously recommended (1, 3): 3 grams of oven-dry fiber and 25 C., respectively. Readings of the stop watch taken at 100-ml. intervals between discharges of 0.0 and 1000 ml. for each stock were plotted against the 1000-ml. readings or freeness values to yield lines that were slightly curved.

Examination of these curves revealed excellent correlation between the time A that had elapsed until 500 ml. had passed through the fiber mat and the time P for the passage of 1000 ml., as shown in Fig. 1 and in accordance with the equation: $P = 2105 \tanh^{-1} 0.00272 A$.

Inspection of Fig. 1 shows that the time required for the free drainage part of the test can be cut to about one-sixth by reading the stop watch after the passage of 500 ml. instead of waiting until 1000 ml. have drained through the mat. Although this relationship holds closely over the entire range from lightly beaten sulphite to groundwood, the accelerated test would find its most frequent application for stocks where the freeness values are in excess of 180 sec. (3 min.).

Sedimentation data collected coincident with this investigation are plotted semilogarithmically in Fig. 2, which shows the relationship between the volume of stock suspension above the four-hole valve and the time elapsed. Since the volume of water between the zero mark and the valve is 185 ml., at the start of the test when the stock suspension is at the 1000-ml. level, the volume above the valve is 1185 ml., which is proportional to the initial head. In the plot, true heads are replaced for convenience by the proportional volumes. Below heads of 685 ml., after the drainage of 500 ml. of water, Fig. 2 shows linearity of head H with time θ according to the familiar equation for box filters: $\log H = a - b\,\theta$.

The slope b, which can be determined graphically from the linear portion of the curve, is evidently a measure of freeness and may be of more value than the usual time for the drainage of 1000 ml. since it is based on two to six readings. The table lists values of 10,000 b, determined by the method of averages (2), for each pure stock and fiber mixture covered in this investigation:

Stock	10,000 b
Unbeaten sulphite	408
Unbeaten sulphite	513
Soda	380
Beaten sulphite	215
Beaten sulphite	196
Beaten sulphite	132
Beaten sulphite	104
60% sulphite, 40% groundwood	43
40.5% sulphite, 59.5% groundwood	15
20.4% sulphite, 79.6% groundwood	9
20.4% sulphite, 79.6% groundwood	8
Groundwood	7
Groundwood	6

References

(1) Davis, D. S., TAPPI Papers, Series 12, 184 (1929); Paper Trade Journal, 88 (22) 173 (1929).

(2) Davis, D. S., "Empirical Equations and Nomography," Chap. 1, McGraw-Hill Book Co., Inc., New York, 1943.

(3) Worm, E. A., and Davis, D. S., Paper Trade Journal, 89 (23) 235 (1929).

*Mr. Taylor is now associated with Silas Mason Co., Burlington, Iowa.

Papermaking economics: the new and the old

An expert discussion of the respective positions in industrial economics of the older and smaller mills of the Northeast and the newer and larger mills in the South.

GORDON B. SHATTUCK
Vice President in Charge of Production
Strathmore Paper Co.

We papermakers in the northeastern states, representing as most of us do old-time, long-established companies, are now faced with some new ideas and new competition—from the South. During the last quarter of the last century and the first quarter of this most of our northeastern mills had their origin. Our mills were located along the rivers where there was water power and where process water was clean and soft. Many of them were located in small communities, were then and still are the chief support of those communities. Coal for fuel was accessible in nearby Pennsylvania; wood for pulp was available in nearby forests, and the great markets in the northeastern cities were convenient for the shipment of finished paper.

With the increase in population of the Middle West, there came the birth of the mills in Ohio, Michigan, and Wisconsin.

But within the last few years the geographical picture of our industry has undergone a radical change. Following the development of processes for successfully using the fast-growing woods of the southern states, a tremendous development of a new southern paper industry has taken place. New mills have been erected, one on the heels of another, in Georgia, Florida, Tennessee and Alabama—all with the most modern, efficient, construction, all with wide, high-speed machines, for volume production. The high cost of these mills has been carefully balanced against their high efficiency of production.

In order that we may all understand the enormity of the change that has taken place in our industry, I want to present just a few statistics which show, quite graphically, our present situation.

Geography and production

The accompanying chart and table shows the productive capacity of the paper and board industry and separates it into four parts geographically: Northeast, Middle West, South and Far West. Paper production in the Far West is, you notice, still small; it is only 8 per cent of the total. But the other three divisions are approximately equal in volume. The South, in which development of the industry started so much later, has already, tonnage-wise, become equal to our much older northeastern division. And whereas in our own area we have some 350 mills the South, with its larger units, has attained the same volume with only about 110 mills.

Such wide generalities, though, dealing with averages, don't mean a great deal, because we lump together in the same figure a mill that has a capacity of 5 tons a day with another with a capacity of 600.

More important is the manner in which the graph columns are subdivided. The lowest section of each column represents productive capacity for board. The section above represents newsprint, relatively speaking a very minor item in our U.S. paper industry (and as you know, only a fifth as heavy as the Canadian newsprint industry.) The section above newsprint shows productive capacity for kraft. Note here the tremendous capacity of the southern mills for this grade. The section above kraft represents production volume for tissue—facial tissue, sanitary tissue, toweling. The big Scott Paper Co. units, in your own territory here, are a large factor in the favorable size of this section of the Northeast column.

The top section is the one in which I have the greatest interest, and the one about which I want to speak a little further. This section represents the fine paper industry; and in this section I have included the manufacturers of book papers and the great variety of specialty papers.

This whole section amounts to about 20 per cent of the total tonnage, country-wide. The book paper industry is the biggest part of the section, amounting to some 13 per cent. The writing paper industry is next, with about 4 per cent; the specialty industry is the balance.

In our northeastern states we have some 134 paper mills in this fine paper group. Our tonnage is not large, but we are the original American paper industry; our mills are the chief support of thousands of workers and many entire communities, and I think it may be said that our mills represent a large part of the industrial backbone of the Northeast. Move our mills to the South, as the textile mills have been moved, and I wager that the resultant disruption would be even more catastrophic.

Southern threat

The threat is there, though, and it is a very real threat. Every additional paper machine put into production in the South represents very real competition to our northeastern industry. Unless it services a market that was not there before—and obviously it can not, its product must inevitably fulfill a part of the demand that was formerly satisfied by a northern mill.

So we've got competition, a new, and a vigorously growing competition; the sooner we recognize that fact for the truth it is, the better. Our competition is growing, and it's growing faster than

Paper presented before the 1952 spring meeting of the Pennsylvania-New Jersey-Delaware Division of the American Pulp and Paper Mill Superintendents Association, held May 9-10 at the Yorktowne Hotel, York, Pa.

the normal demand for paper from an increasing population is growing. So, let's face it and lay our plans accordingly.

I call your attention now to one other feature of my chart. It's this: that so far, up to the present at least, the fine paper section of the southern industry is very small—almost negligible. It appears, then, that to date the southern manufacturers have shown little interest in the small-volume grades of paper. They have built enormous mills based on the economy of huge volumes of southern pulp, largely for board and kraft manufacture. These huge volumes are necessary for the justification of their tremendous capital investments. And it seems logical, too, that this trend will continue. There is a tremendous demand for boxboard, for kraft wrapping and kraft bags; and the larger the production unit, the cheaper the product that can be made and marketed. It's logical development for large-volume items—and the fast-growing Southern forest land provides a logical location. I think that this tendency towards the big plant, the wide and fast machine will continue, will not be reversed.

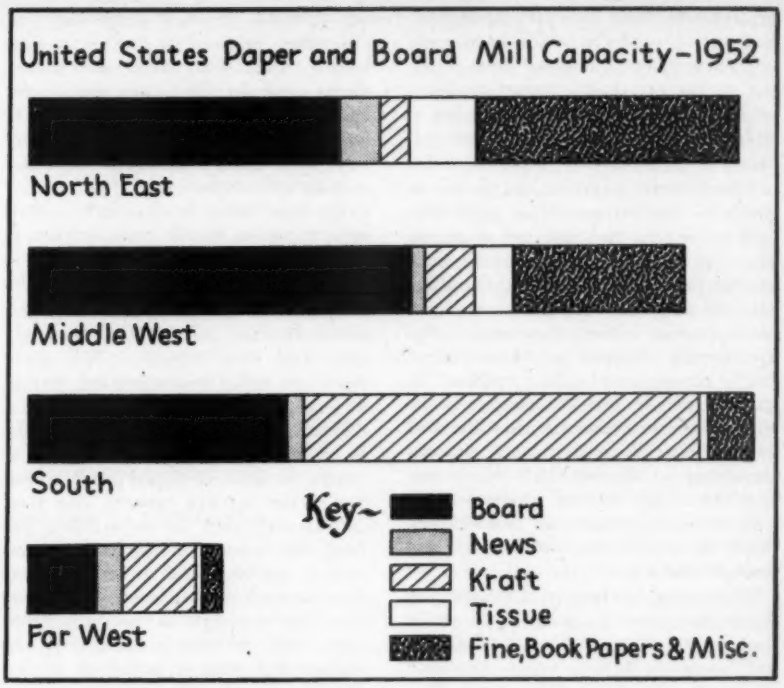
The competition is there, nevertheless. There are some of our mills that will be seriously handicapped, their customary markets permanently lost to them. They in turn, if they are to survive, must adapt their products to the more available markets. Instead of making kraft wrapper, they will make book paper. The book paper market will be surfeited and the regular book paper producer will have to upgrade his product to the next bracket. And so on, step by step. The eventual squeeze, of course, will come to be borne by our large group of small producers of the higher grades of paper in these northeastern states. Ours are the smaller mills, the older mills, the less efficiently laid-out mills, with the narrower and slower machines, the higher costs.

Growth through competition

Are we so inefficient that we must die? Must we, in the natural course of industrial evolution, pass out of the picture and be superseded by the more efficient, better planned plant of 1952?

Some of us may die. Some of us may be unable to justify our continued existence under this intensified competition. If our costs remain high, and our product no better than our competitors', naturally we shall die; we deserve to. If we fail to recognize the nature of this new development of growth, and fail to adapt ourselves to the new facts of life, then we shall certainly find our mills idle and empty. If that happens, we have no one to blame except ourselves.

I refuse to be pessimistic about the future of the northeastern fine paper industry. With our tremendous amount of specialized machinery, with our highly trained and skilled labor force, our accumulated centuries of fine paper experience, and with our ingrained common sense and intelligence and curiosity and ingenuity, I cannot help believing that we can keep our industry intact and healthy, a present and future asset to the country. But we shall have to use our brains, and we shall have to be willing to change our normal ways of doing things; in brief, we shall have to be adaptable to changed conditions.



What, then, is the answer to our problem? I shall not pretend that my answer is the whole answer by any means. The problem will differ as it affects each individual mill, and the correct solution in one place may not be the correct one in another. The solution will be as varied and complex as the problem itself. But I suggest that part at least of the over-all solution must be that we must diversify our products, and go farther than we have gone so far into the specialty paper field. Further than that, it must be our job to develop new papers that will be so unique and useful that they will create their own demand.

Unsatisfied demands

There are constant and insistent demands for papers of unusual characteristics of one kind or another that have not yet been properly satisfied. There are demands, for instance, for these: (a) for a paper that will conduct electricity; (b) for a paper that has a uniformly high wet strength; (c) for a paper with more closely controlled pH; (*d*) for a paper whose dimensions will not be changed by moisture variations, and (e) for a paper with more uniform sizing characteristics.

The size of this potential new market I think is not commonly appreciated.

I want to point, briefly, to a few specific instances where some of our

United States Paper and Board Mill Capacity—1952

	Board	*News*	*Kraft*	*Tissue*	*Book Fine & Misc.*	*Total*
Northeast Mills	124	4	17	74	134	353
Tons/day	11,438	1,595	1,064	2,627	9,709	26,433
Middle West	98	5	15	20	62	200
	14,135	315	1,872	1,451	6,544	24,297
South	55	2	40	2	10	109
	9,530	650	14,752	164	1,892	26,988
Far West	22	4	11	1	8	46
	2,438	970	2,794	68	890	7,160
Totals	299	15	83	97	214	708
	37,541	3,530	20,482	4,290	19,035	84,878

northeastern mills have developed new and useful products which have paid off. They are better than a former product, or cheaper than a former product, or so entirely new in character that a definite market has been found for them.

The thinnest paper in the world is made by The Stevens Paper Mills Inc. and is used for the dielectric spacer in electrical capacitors, vital to the successful functioning of radios, television sets, the proximity fuse, fluorescent light starters, autos, planes, radar equipment, etc. Twenty-five years ago General Electric Co. presented the problem to Stevens to produce a capacitor tissue better and more uniform than the 100 per cent linen tissue then in use. Stevens developed an all-pulp sheet which was superior. They started production on one 72-inch machine; at present they have six fourdriniers running 100 per cent on this paper.

This paper is a precision product, its thickness is two ten-thousandths of an inch (5,000 sheets per inch). Thickness tolerances are plus or minus one one-hundred-thousandth of an inch. The sheet is engineered and formed to meet numerous physical and electrical tests foreign to most paper mills. Its density must be closely controlled; it must be practically impervious to air; it must contain a minimum of conducting particles, may not contain electroytes, must have a neutral pH. Furthermore, it must have good electric strength, good insulation resistance, low power factor and long electrical life.

Technical control in the Stevens mills has been carried to a degree far beyond anything with which most of us are familiar. Beater room and paper machine are thoroughly instrumented. Quality control has been taken practically entirely out of the hands of machine operators and has been assumed by the laboratory staff. The physical testing laboratory and the electrical testing laboratory are the nerve centers of the whole productive mechanism. The Stevens company has pioneered the way in the direction of scientific control.

A broad field for the development of new and useful products lies in the combination of a cellulose web with other materials, such as rubber latex and plastics.

Paper for shoes

Premoid Corp. has been one of the pioneers and leaders in the "synthetic leather" industry. One of its products is a sock lining for ladies' shoes. It consists of a base of pulp fibre and leather —coated on one side with a vinyl plastic. It is tough, highly resistant to scuffing and wear, and so attractive in a variety of colors that it adds to the attractiveness of the finished shoe.

Another Premoid product is an embossed vinyl coated sheet. It is extensively used for belts, luggage, purses and novelties. For these purposes it is less expensive than leather and in many ways superior. It is strong; it is flexible; it is resistant to moisture, it can not be easily scratched or scuffed; it will often outlast leather in the same service; it is definitely not a cheap imitation. It is available in a variety of striking colors.

The line of distinction between paper, rubber, leather and glass is becoming more and more indistinct. Not many years ago paper was one thing, leather was another, rubber and glass distinctly different. But now, with newer manufacturing techniques and synthetic materials, we have developed products that bridge the barriers between one class and another; they are neither flesh nor fowl, but better than either. They present a challenge and an invitation to producers of thousands of items, from handbags to gaskets to filters and furniture. And certainly to date only the surface has been scratched of a vast number of useful combinations.

Strathmore Paper Co. includes in its regular advertised line two items which are rather unique specialties. One of them we have called Double Deckle. It is made on a special paper machine and features a duplex color and a colored deckle edge border on one side. The paper is made in lightweight and cover weight, and the lighter color on the cover matches the darker color of the lightweight sheet. The two features of duplex color and colored border make this paper a "natural" for attention-arresting advertising pieces.

The other is Fiesta, which features a narrow colored deckle edge and an attractive rough surface.

Both these papers were mill-developed, with the idea in mind that these attractive products would inspire designers of printing to create pieces unusual and forceful. They are examples of items where the papermaker must devise his own equipment and take exceedingly careful pains in production. In color matching, for instance, there are two colors to be matched instead of one, and one color affects the other. These sheets are not easy to make. It is only the mill that has the small paper machine that can and cares to take the trouble involved to manufacture such products.

Wilbraham Paper Corp. produces an interesting specialty. It is a duplex sheet, the white side composed of deinked ledger stock, the back of a wastepaper furnish. Whereas most similar duplex sheets are made on cylinder machines, this sheet is produced on a double fourdrinier. The two webs meet after the dryers and are pasted together before passing through the calenders.

The paper is used for lithographed boxes. Because, being made on a fourdrinier, it is less directional in strength and expansion than a cylinder paper, it is a superior sheet for four-color lithography that requires close register. A laminated sheet, it has greater stiffness for the same weight than a single board.

Battery plates

This next product has, I think, a fascinating story. It is redwood bark fiber paper. It is an achievement of the Hollingsworth & Vose Co. research and production teams.

To meet the specifications of a section of the U.S. Armed Forces, a leading storage battery manufacturer needed a battery plate separator with unusual characteristics, which included high liquid absorption, the ability to swell, and a certain rigidity of sheet. Hollingsworth and Vose instituted a program of research and development to solve the problem.

As the study progressed, it became apparent that conventional papermaking fibers possessed many of the desired characteristics; but in attempting to develop some of these characteristics to the proper degree, certain others were lost. The perfect fiber was at last found to be that from the bark of the California redwood. From the successful laboratory demonstration, the program advanced to a model semi-commercial installation, and from there to actual paper mill production.

The redwood fiber is received from the West Coast in bales. The material is charged into digesters and treated chemically to remove all but the basic, chemically inert material. The fibers are then washed and refined. Special methods of handling and special refining cycles had to be developed to overcome the peculiar behavior of the material. With optimum development during refining, the normal papermaking characteristics of the fiber are considerably different from conventional stocks. After moderate changes to the paper machine, the material could be handled with modified standard operating techniques.

The resulting amber colored sheet is chemically inert to the battery electrolyte. The exceptionally high liquid absorption, swelling capacity, and sheet rigidity combine to fulfill all the requirements of the particular application. To insure each of the desired properties, special tests are conducted throughout processing and after manufacture. Uniformity of lot to lot performance is guaranteed by limits on such properties as swelling, absorption, capillarity, and chemical reactivity in addition to the usual paper quality tests.

Kemart process

An interesting instance of cooperation in which four parties pooled their talents towards the development of a superior reproduction technique is provided by the Kemart Process. Kemart Corp. of California had the idea and furnished specially prepared artists' paints. Strathmore Paper Co. furnished a 100 per cent rag drawing paper with superior erasure characteristics and exceptional wetting properties, containing a fluorescent dye which emits white light in the range of approximately 4300 angstrom units when subjected to an ultra violet light. Plastic Coating Corp. and the Ansco Division of General Aniline & Film Corp. contributed a photographic paper having fluorescent characteristics similar to those of the drawing paper.

By means of these products and the Kemart technique, the photo engraver is enabled to greatly extend his range of contrast, from a true white to a solid black. Essentially, the highlights are accentuated.

A drawing, or a combination of drawing and photograph, may be reproduced faithfully, sparkling whites and rich blacks being obtained without the necessity for costly retouch work either on the film or plate. The result is a better reproduction at a lower cost. Colored drawings, too, may be reproduced, with the use of filters, in accurate faithfulness to the original.

Transformation of paper

Plastic Coating Corp. produces a wide variety of materials, most of them representing the transformation of paper into other things. One of them is an impregnated paper for book binding, more durable than the common cotton book cover. One is a synthetic leather, similar in appearance to the Premoid product; one is on a rag paper base, and it has a tremendously high edge tear resistance. One is a specially treated paper for a newly designed shotgun shell closure; it must withstand explosion temperatures without burning, and it fractures in such a manner that the gun's accuracy of fire is not impaired.

Another is a wrapping for x-ray and light-sensitive film; in manufacturing this material, all process water and other materials used during a run must be tested with a Geiger counter and other methods for detecting the presence of radioactive particles. Radioactive particles from an atomic bomb cloud are carried to earth by rain or snow thousands of miles distant from the explosion site; and the resultant pollution of local water supplies has ruined much photographic film and paper.

These unique products that I have described briefly are only a few of the many—they represent a few of the successful achievements of some of our northeastern mills. They are the result of many years of effort and the expenditure of many thousands of dollars' investment. There are others, of larger volume and more commonly known, such as photographic paper and reproduction papers of the blueprint and direct print types. These papers, too, because their specifications are so exacting, will for a long time to come be in the province of the smaller producer. I use these illustrations merely as an indication of the general direction in which I think many of our mills will have to move if they are to stay abreast of the times and find their proper place in tomorrow's competitive order of things.

Four steps to revitalization

The adjustment for some mills will not be easy. There are, as I see it, four distinct steps that the management of old-line, conservative paper mill will have to take in order to re-vitalize itself:

First, and most important, the management itself must develop within itself an open attitude based on service to the customer. In the long run, the old slogan "The customer is always right" is fundamentally true: what the customer demands, the paper mill must be ready and able to supply, and management must be willing to approve the expenditure of the time and money necessary to attain the desired results. It must be willing to risk money for some projects that may not prove profitable, in the expectation that the profits from others will overbalance the loss.

Second (and these others will be possible only if management has its willing-to-risk attitude), the papermaking equipment of the mill must be made flexible. Most paper specialties, at least in their period of acceptance development, are small-volume items. Our mill must be willing to make a few three-engine runs of a specialty product, hoping that it may develop into a 50-engine item, but accepting the risk that it may not. The three-engine specialty may require an additional marking press; it may require an inventory investment in unusual materials; it may require unusual finishing, laminating or packaging equipment. Whatever machinery or equipment is necessary to give the customer what he needs must be provided; and if our mill has 50 specialties, all small-volume, it will have to have a large investment in stand-by, infrequently used equipment. But let that not worry our management; for often, with specialties, to-the-consumer price is a minor factor.

Third, our mill must make an investment in technical personnel. It must invest in research. It must develop a capable staff of chemists familiar with the problems of both the paper industry and several allied and complementary industries.

At Strathmore—to give an example of how one company has made a real effort in this direction, we have maintained for the last 23 years a research fellowship at Mellon Institute in Pittsburgh. It has repaid its cost, in profits, several times over.

The fourth step includes all matters involved to the end that product variables be controlled to the highest possible degree. Major factors in this control of variables are the development of an adequate and efficient organization of technical control, and the scientific and accurate measurement of variables by instrumentation. Our mill must go in the direction indicated by Stevens, where responsibility for quality to a great extent has been taken out of the hands of the beater engineer and machine tender and assumed by the laboratory staff. Manual and visual control is no longer good enough, and experience relies too much on fallible human memory. We must have instruments that measure changes so small that the eye and the hand cannot detect them. The laboratory staff must have the specialized training to interpret these measurements and to direct their correction.

These four steps are quite general, and vague, I know. They must be. I have not suggested a single specific piece of equipment that must be purchased, nor a single instrument, or even suggested the nature of the tests that our technical control staff must make. All will be different, in every mill and for every product.

General program

I merely suggest this as a general program: I see a great new industry that has grown to an astounding degree in the southern states in an unbelievably short period of time; I see it as inevitable that some of our markets will be taken from us by this new segment of the industry, and I believe that we should plan now to take those steps which will better prepare us to assume our new role within the economy of the industry. And that new role, it seems to me, lies in the direction of the specialty, or technical, or tailored product. Our plants are well adapted to that kind of a product; we do not need the big tonnages and high speeds to pay off our capital investments. We have the plants; we have the experience and know-how; and I think that we have the ingenuity and the vitality and the willingness to risk our money and time to satisfy all the demands that are made upon us. Surely, let's not sell the northeastern mills short! They still have a substantial future ahead of them.

In handling $1,000,000 payroll . . .

Champion Paper uses the IBM calculator

GETTING OUT A PAYROLL in excess of one million dollars a month is in itself a big job, but it is only a small segment of the functions performed by the accounting department at the Hamilton Div. of Champion Paper and Fibre Co., Hamilton, Ohio.

The department is divided into sections or groups—namely, accounting, payroll, tabulating, and production-records. The work of the tab group is principally concerned with IBM, with the work of other groups funneling into the IBM, or mechanical "brain," operations. Here, with the use of key punchers, verifiers, multipliers, collators, and other machines, all records are compiled for payroll, cost, invoicing, budget, inventory, departmental expense distribution, management control of payroll—even to the extent of controlling waste.

Hourly payroll attendance cards—time cards—are prepared in this department. Throughout a normal bi-weekly period 24,000 IBM cards are key punched or reproduced, verified, multiplied, and collated for preparation of final reports. In this department, also, old age benefits and withholding tax for each employee are automatically compiled. All time earnings are calculated mechanically via IBM multipliers, as are various and sundry deductions.

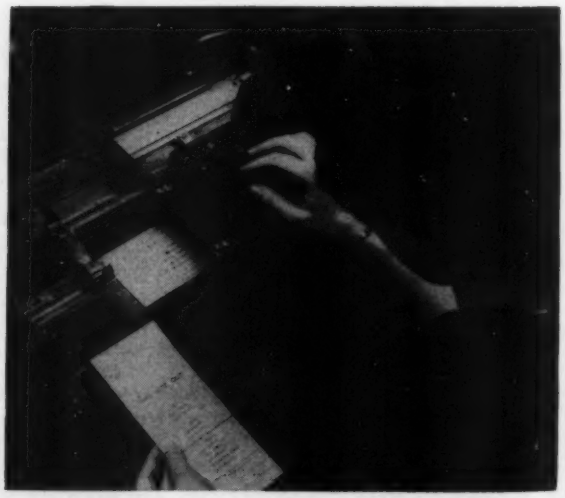
One of the responsibilities of the accounting department is the computation and payments of local, state, and federal taxes. Last year the Champion firm, with mills at Canton, N. C., Houston, Texas, along with vast timber holdings in the South, paid more than $12,000,000 in taxes. With reference to "deductions," Champion's accounting department doesn't like the word. Rather, it would prefer that employees think of "deductions" as "benefits."

Among the first in the paper industry to use the IBM electronic "brain," Champion has found multiple uses for the machine. However, to illustrate its use in compiling payroll only, this series of pictures is submitted.

1. REGISTERING "in" and "out" hours via a time clock, a Champion employee initiates the payroll operation

2. CHECKING recorded clock hours and job assignments against the supervisor's time report is the second step

3. ASSEMBLING registered clock hours and job assignments is the responsibility of payroll personnel



4. TRANSFERRING data from the time card to IBM tab cards, key puncher's coded perforations will record information

5. VERIFYING the IBM key puncher's coded perforations, more than 24,000 tab cards are handled biweekly in payroll alone

6. OPERATING the IBM "brain", Tab personnel can rapidly arrive at desired information

7. CONTROLLING panels act as the "brain" for IBM machine; each panel conforms to a particular set of specifications

8. SORTING coded cards, this machine can separate over 600 cards per minute, arranging them in alphabetical order

9. COLLATING, this machine enables the operator to merge two sets of cards, which have been coded, into one group

10. PRINTING the employee's payroll check, this machine performs the final operation in a highly complex procedure

Figure 1—A large paper machine at Ohio Boxboard is well lighted with heavy-duty, totally-enclosed high luminaires with 1000-watt incandescent lamps; rows of luminaires are centered over side and center aisles with units on 7-ft. spacing; mounting height is 35 feet, and illumination is 20 foot-candles maintained

Ohio Boxboard achieves . . .

Better paper through engineered lighting

W. H. KAHLER and W. P. WERNER
Lighting Engineers
Westinghouse Electric Corporation

WITH TWO YEARS EXPERIENCE to back it up, Ohio Boxboard Co., Rittman, Ohio, has pinned the credit for better quality paper, easier maintenance of equipment, and reduced accidents on their engineered lighting system.

The characteristics of the paper making machines presented several problems to plant electrical engineer, Milton Wuest, who planned the lighting. High temperatures, water vapor and paper dust in the plant ruled out ordinary lighting equipment. Safe operation of the high-speed paper machines and efficient maintenance of these machines demanded a uniform distribution of illumination. The lighting also had to be suitable for inspection of the product during the manufacturing process. Extreme bulk of the machines could obstruct the proper distribution of light, so it was important to correctly place the lighting units to prevent harsh and dangerous shadows and to provide proper light when machinery and equipment were being cleaned or repaired. High mounting meant the system had to be as maintenance-free as possible. All of these specific conditions had to be considered during the planning stages.

Mill Room

General lighting equipment is located in rows over the center and side aisles (Fig. 1), and wide-spread reflector distributions furnish a maximum of shadow-free vertical illumination on the sides of the machines. The luminaires are a heavy-duty totally-enclosed Millite type that meets the severe service requirements (rugged, vapor-tight, and dust-tight). One-thousand-watt lamps produce an average of 25 foot-candles (maintained), and distribution of light is practically uniform from side to center of mill room (no harsh shadows).

Supplementary lighting is supplied between the rolls in the dryer sections with 750-watt enclosed VRC-18 type floodlights (Fig. 2) equipped with stippled lenses to prevent bare lamp glare and to provide a certain amount of diffused light. The main floodlight beam is directed below the normal eye level, and the units are mounted approximately 12 feet above the floor.

Roll Storage

Here sufficient illumination is a requisite for safe handling of the heavy paper rolls by the crane (Fig. 3). Vertical lighting is equally as important as horizontal for the correct identification of the rolls that are marked or tagged on the side.

Wide-spread enclosed Millite luminaires are used with 1000-watt lamps. Spacing is 20 x 25 ft., mounting height is 25 ft., and the average illumination is 15 foot-candles maintained.

Electrical Distribution and Control

The lighting system is supplied from 200-Kva, 2300 to 120/240-volt single-phase transformers, each of which is protected by an 800-ampere De-ion circuit breaker.

The lighting circuits are distributed from panel boards with 25 ampere Quick-Make Quick-Break double-pole circuit breakers. For quick, clear identification of the circuits, each panelboard door carries an outline plan of the lighting fixture arrangement served by the panel in the area. Lighting unit groupings are numbered to correspond with their respective circuits.

Figure 2—Supplementary lighting between the rolls in the dryer section is supplied by 750-watt enclosed-angle type floodlights; a stippled lens prevents bare-lamp glare, provides a limited amount of diffusion

Figure 3—The roll storage space at Ohio Boxboard is lighted with 1000-watt heavy-duty high-bay luminaires on 20 x 25 ft. spacing and 25 ft. mounting height; wide-spread reflectors are used to give maximum vertical footcandles for reading identifications on the sides of the rolls

THE INVENTION of a PAPER PETTICOAT

made to sell at 15¢ caused a real sensation when it appeared on the market in 1870.

In the late 1700's, French tailors cut their clothes with the help of patterns made of blue paper. . .These blue paper patterns were considered so valuable that they sometimes were given to worthy apprentices as a special reward. The patterns themselves often were bequeathed by fathers to their tailor-sons.

The FIRST blotting paper made commercially was probably that turned out by a mill in Berkshire, England early in the 1800's. This blotting paper always was pink—made from red rags which were difficult to bleach.

Odd Bits

WATER REPELLENT PAPER

laminated to a film and developer is being used in a simple portable radioactivity tester that enables any ordinary soldier to check his exposure to radiation when entering bombed areas.

OLIVER

Just so you won't forget!

Oliver Ringvalve Brown Stock Washer	Oliver Bleach Washer (Pipe Type)
Oliver Ringvalve Bleach Washer	Oliver Brownstock Washer (Pipe Type)
Oliver Ringvalve Decker	Oliver Saveall
Oliver Ringvalve Decker-Saveall	American Saveall (Disc Type)
Oliver High Density Thickener	Oliver Lime Mud Filter
Oliver Decker (Pipe Type)	Oliver Board Former

Constructed with or without corrosion-resisting materials

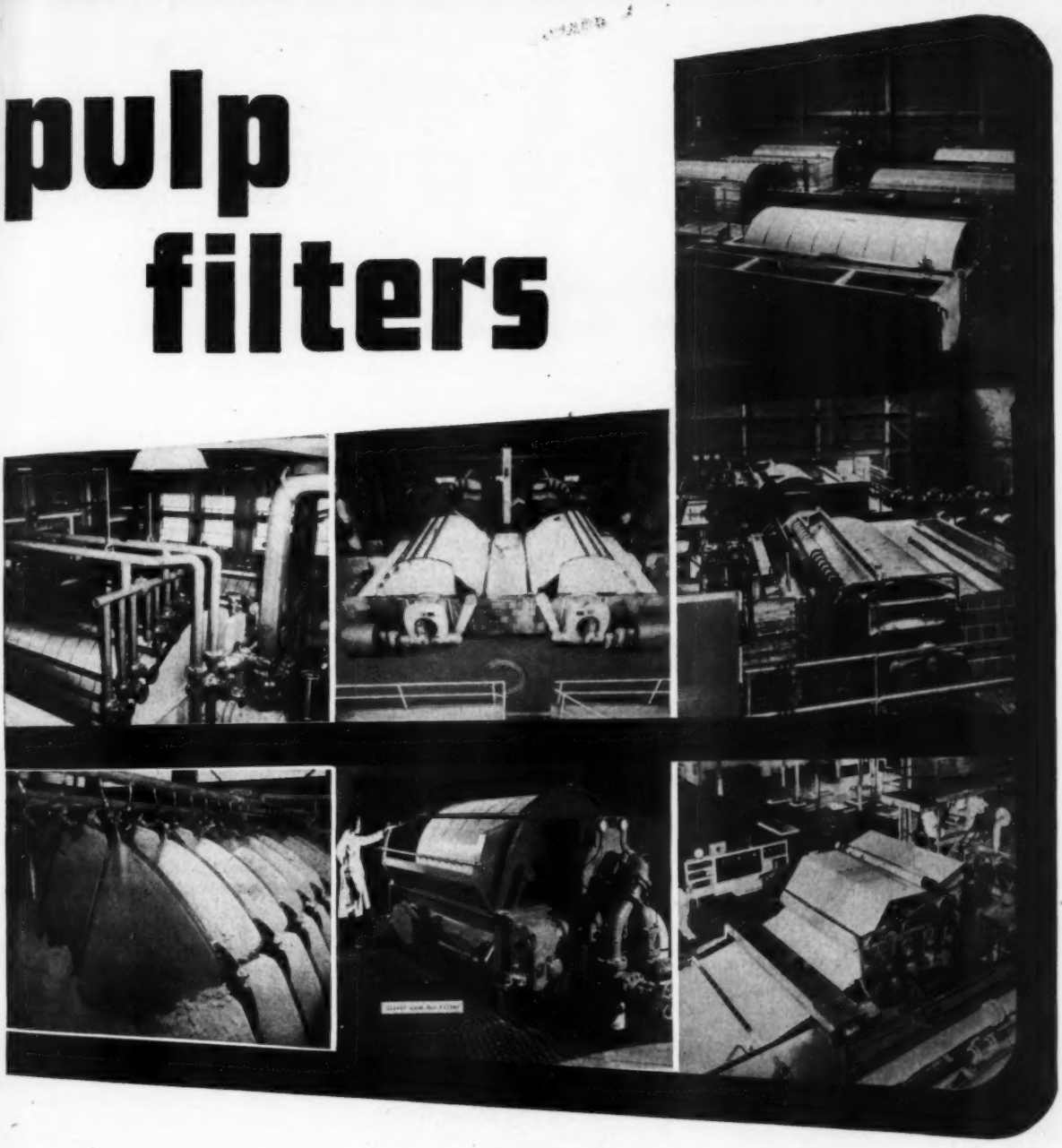
You can get complete information on these units from the following Oliver United engineers attending the Convention and registered at the Sheraton-Cadillac: Glen G. Reed, Fred L. Schorken, Anthony W. Huberty, Raymond J. Bowlan.

Each of these twelve Oliver United units has proved its worth many times . . . this worth being measured in plus capacities, thorough washing, low maintenance, and durability.

With something like 1400 Oliver pulp filters of all types in service, each engineered to meet its specific requirement, our engineers have acquired a wealth of pulp dewatering and washing experience. All of this, of course, is available to you in lining up suitable equipment for your new or expanded pulp or paper mill.

Our service is not only national through our New York, Chicago and Oakland offices but international through our many representatives. Each office and representative is staffed to help you.

pulp filters



New York 36 — 33 W. 42nd St. Chicago 1 — 221 N. LaSalle St.
Oakland 1 — 2900 Glascock St. San Francisco 11 — 260 Calif. St.
Export Sales Office — New York • Cable — OLIUNIFILT

FACTORIES:
Hazleton, Pa.
Oakland, Calif.

OLIVER UNITED FILTERS DUF INC.

WORLD WIDE SALES, SERVICE AND MANUFACTURING FACILITIES

CANADA
E. Long, Ltd.
Orillia, Ontario

MEXICO & CENT. AMERICA
Oliver United Filters Inc.
Oakland, Calif.

INDIA
Dorr-Oliver (India) Ltd., Bombay

EUROPE & NORTH AFRICA
Dorr-Oliver S. A. Brussels
Dorr-Oliver S.N.a.R.L. Paris
Dorr g.m.b.h. Wiesbaden (16)
Dorr-Oliver Co., Ltd., London, S.W. 1
Dorr-Oliver S.a.R.L. Milano
Dorr-Oliver, N.V. Amsterdam-C

PHILIPPINE ISLANDS
E. J. Nell Co.
Manila

HAWAIIAN ISLANDS
Honolulu
A. R. Duvall

WEST INDIES
Wm. A. Powe — Havana

SOUTH AMERICA & ASIA
The Dorr Co.
Stamford, Conn.

AUSTRALIA
Hobart Duff Pty., Ltd.
Melbourne

SOUTH AFRICA
E. L. Bateman Pty., Ltd.
Johannesburg, Transvaal

Fourdrinier Problems Discussed by Superintendents at York, Pa., Meeting

Three hundred paper mill superintendents and equipment manufacturers were given an opportunity to compare notes on fourdrinier problems during a panel discussion at the spring meeting of the Pennsylvania-New Jersey-Delaware Division of the American Pulp and Paper Mill Superintendents Association, held at the Yorktowne Hotel, York, Pa., May 9-10.

At the morning session, prior to the panel discussion, Gordon B. Shattuck, manager of supplies of Strathmore Paper Co., discussed the changed geographical picture of paper manufacturing that has materialized in the last few years as a result of the rapid rise of a new and vigorously growing paper industry in the South. (See page 360 for this paper in full.) Another paper read by R. A. Herlihy, MacAndrews & Forbes Co., dealt with fiber insulation board manufacturing—an industry in which continuous cylinder forming machines and multiple deck dryers have become standard equipment.

One of the highlights of the meeting was the visit to the mill of the Schmidt & Ault Paper Co.

Fourdrinier Problems

The Saturday afternoon program was devoted to a panel discussion on the fourdrinier. Romeo Tourangeau, general superintendent, W. C. Hamilton & Sons, led the discussion. Panel members were: Jack McKela, Black-Clawson; B. L. Hammill, Beloit Iron Works; Allan Lowe, Sandy Hill Iron & Brass Works; H. C. Merritt, Downingtown Mfg. Co.; C. H. Butterfield, Bagley & Sewall Co., and Andrew Jackson, Pusey & Jones.

Cycling-Refining—an Integral Part of the Fourdrinier

Jack McKela, Black-Clawson, described briefly the Hydracycle and the Duo-Cycling Systems. The Hydracycle system includes the following special purpose equipment:

(1) A Hydrapulper which slushes lap stock before it is passed to the cycling-refining stage. (2) Two Hydracycle chests and a required number of Hydrafiners are used in the cycling-refining stage. The furnish is passed through the Hydrafiners to the top of one of the two chests and then recirculated through the Hydrafiners until the desired furnish strength has been achieved. Another batch of furnish from the Hydrapulper, which in the meantime has been delivered to the second Hydracycle chest, is then fed into the Hydrafiners without a shutdown.

The stock in the first chest is blended and mixed with various chemicals with the aid of a propeller-agitator which circulates the stock over and under the midfeather of the Hydracycle chest. Intimate blending is achieved in a matter of seconds or minutes, depending on the nature of the stock. The stock is then ready to go into the machine chest and to the jordans.

The Hydracycle system is operated by remote control from a central panel board where one operator has complete control over the entire stock preparation.

The Duo-Cycling system has two separate refining chests, which are both in use during the refining stage. Stock is automatically and alternately pumped through the Hydrafiner from one chest to the other until the desired strength characteristics have been achieved. A separate blending chest is equipped with a multiple cluster of vertically mounted propeller agitators.

Improvements in Fourdrinier Design

B. L. Hammill, Beloit Iron Works, discussed a number of important improvements made on the fourdrinier which have resulted in increased efficiency and output. The fourdrinier, he said, must be designed in such a way as to handle the flow of furnish from the slice to the couch with a minimum disturbance to the sheet, the most critical condition being that of the first few feet of the table where high fluidity of the sheet and rapid drainage tend to flood the table rolls. An adjustable forming board between the breast roll and the first table roll, well designed deflectors following the table rolls, and dandy-type or other specially designed grooved rolls have been found to be effective in attaining better control over the water removal problem.

The design of the wire stringing equipment has undergone considerable change. It now incorporates a motor-driven breast roll and forming board lowering device which provides sufficient wire slack to permit wire-stringing over the whole fourdrinier as a unit, without the necessity of relocation or removal of wire rolls or other component parts.

On some machines the suction box oscillating drive has been placed under the fourdrinier beam to permit the placement of the last suction box near the couch and to obtain more forming space.

The air-operated diaphragm type guide is a new development which provides a safer and practically maintenance-free means of holding the wire or felt in its correct operating position, said Mr. Hammill. The guide receives the control impulse from the position of the wire, thus eliminating the necessity of tie-in with the speed of the machine and permitting the guide to operate satisfactorily over a wide range of paper machine speeds.

Mr. Hammill pointed to two recent developments in handling the transfer problem which effectively reduce the number of breaks at the couch end of the machine. Large diameter lump breaker rolls may be used which permit greater nip pressure without inducing crush. This results in greater dryness and hence a safer open transfer of the sheet. For light-weight papers, other than tissue, the automatic suction pick-up has proved itself very satisfactory. The suction transfer is accomplished by drawing the sheet into the felt, thereby eliminating the open draw.

Fourdrinier Press Section

H. C. Merritt of Downingtown briefly described the composition of press-roll surfaces and the sequence in which suction and plain presses are used in the press section of the fourdrinier. He discussed in more detail the anti-deflection rolls of the smooth press, methods of loading the presses, and the strain gauge system which permits direct reading of the load.

Anti-deflection rolls do not require a crown and are designed to give a practically straight-line nip at any pressure within the design capacity of the rolls. They can be used in any plain press po-

HEAD TABLE guests at the Kalamazoo Coating Conference. They are (l to r): H. Ray Hall, Jack Marks, Leon H. Mimms, Richard H. Peeters, Dee James Andella, the speaker, Merle R. Wilkins, John R. Dam, Glenn Davidson, Harrison Kindig, and A. T. Luey

sition, but results obviously must justify the added expense of these rolls. As a compromise, one may install a single anti-deflection roll in conjunction with a bottom suction press. Such a roll is of a different design and requires about half the crown of a conventional roll.

Methods of loading are either mechanical, pneumatic, or hydraulic, said Mr. Merritt. In mechanical loading care must be taken to insure a sensitive linkage with a minimum of friction. Pneumatic loading is accomplished by means of diaphragm or cylinder. While the diaphragm method is the more accurate, its short stroke makes it necessary to have additional facilities for raising the rolls, which entails added expense. Cylinder type air loading presents the problem of uneven bind of the pistons and cylinder packing. Furthermore, in pneumatic loading both diaphragm and cylinder systems are subject to air-leakage.

Hydraulic loading, according to Mr. Merritt, eliminates most of the disadvantages of pneumatic loading. High hydraulic pressures are more easily obtained, and the equipment to produce the required pressures is simpler and less costly. The hydraulic system has the disadvantage of smaller resilience when compared with the pneumatic system. However this is not a limiting factor in today's paper mill operations, Mr. Merritt declared.

Allan Lowe, Sandy Hill, briefly reviewed the type of equipment needed to keep the stock in dispersion and deliver it to the pond and the wire. Dispersion and maintaining the fibers in dispersion is one of the major problems in papermaking, he said.

C. H. Butterfield, Bagley-Sewall, brought to the attention of his audience the various and numerous problems that had to be considered when making a decision as to whether to (1) draw up specifications for a new drying section, or (2) bring the old drying section up to modern standards of performance. In this connection he described and stressed the importance of such factors as double deck or vertical gearing, enclosed or other type of lubrication, steam joints, drainage, controls, application of doctors and ventilation.

Andrew Jackson, Pusey & Jones Corp., discussed calender equipment and its applications, cautioning the audience not to expect results for which the calender was not designed.

Officers of the Pennsylvania-New Jersey-Delaware Division of the Pulp and Paper Mill Superintendents Association are: Elmer Mitchell, Glassine Co., chairman; George Suydam, Riegel Paper Corp., first vice-chairman; Andrew J. Luettchen, P. H. Glatfelter Co., secon vice-chairman; Clarence F. Kingston, Hammermill Paper Co., third vice-chairman; Joseph A. Paciello, E. I. du Pont de Nemours & Co., secretary-treasurer.

Exacting Demands on Coated Paper Discussed at Kalamazoo

"Improvement of Paper Printability Through Coating Quality" was discussed April 17 by Dee J. Andella as he addressed a joint dinner meeting of the Michigan Division of the Superintendents Association and the Kalamazoo Valley Section of Tappi. Mr. Andella is a member of the illustration staff of the *National Geographic Magazine.*

The limitations of the printer, in reproducing the endless variations of color at high speed with only three colors—yellow, red and blue, and black—and the great improvement in color photography demanding greater color fidelity, according to Mr. Andella, impose heavy technical demands on the paper maker. He related that certain variable factors in paper printability can be adjusted within limits to improve results; but stressed the fact that nothing practical can be done with the paper itself once it is manufactured to change its printability.

Twelve requirements for coated paper from a color reproduction viewpoint were listed by the speaker. They are: consistent performance, surface smoothness, ink receptivity, good surface strength, uniform thickness, proper opacity, coating surface brightness, paper color, paper resiliency, balanced moisture content, uniform formation, and a high degree of permanency in color and body.

Following Mr. Andella's talk, a panel group discussed the subject. Members of the panel were as follows: H. Ray Hall, Allied Paper Mills; Jack Marks, Upjohn Co.; Leon H. Mimms, Kalamazoo Paper Co.; Glenn Davidson, paper consultant; Harrison Kindig, Mac Sim Bar Paper Co., and A. T. Luey, Sutherland Paper Co. Merle R. Wilkins, Michigan Paper Co., was moderator.

Richard H. Peeters, Michigan Division chairman, presided. He introduced John R. Dam, Tappi section chairman. Some 130 members and guests were present. Among them were 19 members of the pulp and paper technology curriculum at Western Michigan College, headed by Dr. Alfred H. Nadelman, in charge of the curriculum.

Pulping Methods Stressed at Madison Technical Conference

More than 25 technical experts from paper and pulp mills throughout the country attended the Annual Technical Conference sponsored jointly by the APPA Committee on Coordination of Research and the U.S. Forest Products Laboratory, which was held at the Laboratory in Madison, Wis., May 13. Members of the Laboratory staff presented 11 papers during the all-day program.

A highlight of the discussion was the presentation of a paper on "A Physiological and Anatomical Study of the Re-

sponse of Trees to Girdling and Chemical Treatment," prepared by H. W. Popp, D. A. Kribs, and M. Reines, all of the Department of Botany of Pennsylvania State College. The research was done in cooperation with Armstrong Forest Co., New York & Pennsylvania Co., Inc. (This paper will be reviewed in a forthcoming issue of THE PAPER INDUSTRY.)

Papers presented at the conference were as follows: "Integrated Utilization of Wood Resources"; "Progress in Semichemical Pulping Research," J. N. McGovern; "Pulping Hardwoods by the Cold Soda Process," K. J. Brown; "Review of Processes for Recovery of Neutral Sulphite Semichemical Pulping Spent Liquors," P. K. Baird; "Pulps for Chemical Conversion," F. A. Simmonds; "Some Studies on Alpha Cellulose from Wood," W. E. Moore; "Dimensional Stability of Wood and Paper," A. J. Stamm; "New Developments in the Hardboard Industry," H. D. Turner; "Development and Application of Basic Design Data for Fiberboard Shipping Containers," E. F. Landt; "Fiber Drums for Shipping Containers," H. C. Nicholls, and "Problems in the Packaging of Prelubricated Bearings," V. W. Meloche.

Speaking prior to the formal opening of the meeting, E. W. Tinker, executive secretary of APPA, cited the value of the committee's work. He noted also that the future economic welfare of the United States depends on the work of research men. W. E. B. Baker, chairman of the APPA committee, declared in a brief address that coordination of research such as that characterized by the group which he heads might well be carried into other industries. G. H. Chidester of the Laboratory was in charge of the meeting.

New Interest in Tissue Assoc. Grade Labeling Program

As a result of the easing of the supply of high-grade bleached pulps as indicated by the revocation of M72, the wood pulp control order, renewed interest has been shown in the Tissue Association Inc.'s grade labeling program for wrapping tissue. According to Ross A. Fife, executive secretary, manufacturers of No. 1 and No. 1½ wrapping tissue are demonstrating support of the project.

The program was initiated in 1940 immediately following the revision of Simplified Practice Recommendation R46-39 for tissue papers. It gained quick and enthusiastic support from a majority of the manufacturers of the better grades. This support continued until the wartime scarcity of woodpulp made it impossible for many users of the label to produce a sheet which met the specifications of SPR 46-39.

The contract between the Tissue Association and the users of the label provides for: (1) recognition of SPR 46-39 grade definitions as standard practice; (2) simple and efficient means of determining the accuracy of the labeling through impartial testing laboratories if a question ever arises as to quality, and (3) revocation of the manufacturer's right to use the label if misuse is proven.

Wood Technology Discussion Set for 6th FPRS Meeting

Wood technology will be discussed at the final session of the Forest Products Research Society's sixth annual meeting, which is to be staged at the Schroeder Hotel in Milwaukee June 23-25. The session is to be moderated by George Stanley, chief engineer for Hegewisch Division, Pressed Steel Car Co., an authority on the manufacture of plywood.

M. A. Millett

Louis E. Wise

R. M. Lindgren

H. P. Sedziak

George Kitizawa, New York State College of Forestry, Syracuse, will speak on "Young's Modulus of Elasticity of Small Wood Beams by Dynamic Measurements." The acceptibility of this method as a test method will be discussed and the correlation between sonic tests and binding tests noted.

Merrill A. Millett, chemist at the U.S. Forest Products Laboratory at Madison, will discuss "Chemical Brown Stain in Sugar Pine." He concludes that the best means of controlling it is to secure better coordination between cutting and processing operations, and to use moderate kiln schedules.

Staff members of the Institute of Paper Chemistry, Appleton, will present a joint paper on "The Chemical Composition of Tropical Woods." L. E. Wise, R. G. Rittenhouse, Edgar E. Dickey, O. H. Olson, and Consuelo Garcia will tell of results from 16 different woods, which are organized both qualitatively and quantitatively. Resistance to insect penetration in tropical woods as compared to U.S. hardwoods is also mentioned in this report.

R. M. Lindgren and G. M. Harvey, USFPL, will discuss "Decay Control and Increased Permeability in Southern Pine Sprayed with Fluoride Solutions." The paper shows a striking reduction of decay and increase in permeability results from the use of surface applications of sodium or other fluorides.

"The Evaluation of Two Modern Wood Preservatives" by H. P. Sedziak, Canadian Forest Products Laboratory, Ottawa, is the study of copper napthenate and pentaclorphenol as undertaken by the Canadian FPL. The techniques for evaluating wood preservatives will be stressed.

L. A. Mueller, technologist at the Southwestern Forest and Range Experiment Station, Tucson, will discuss "Forest Utilization Problems and Opportunities in the Southwest Region." Major forest types, manufacturing industries, and waste problems will be discussed.

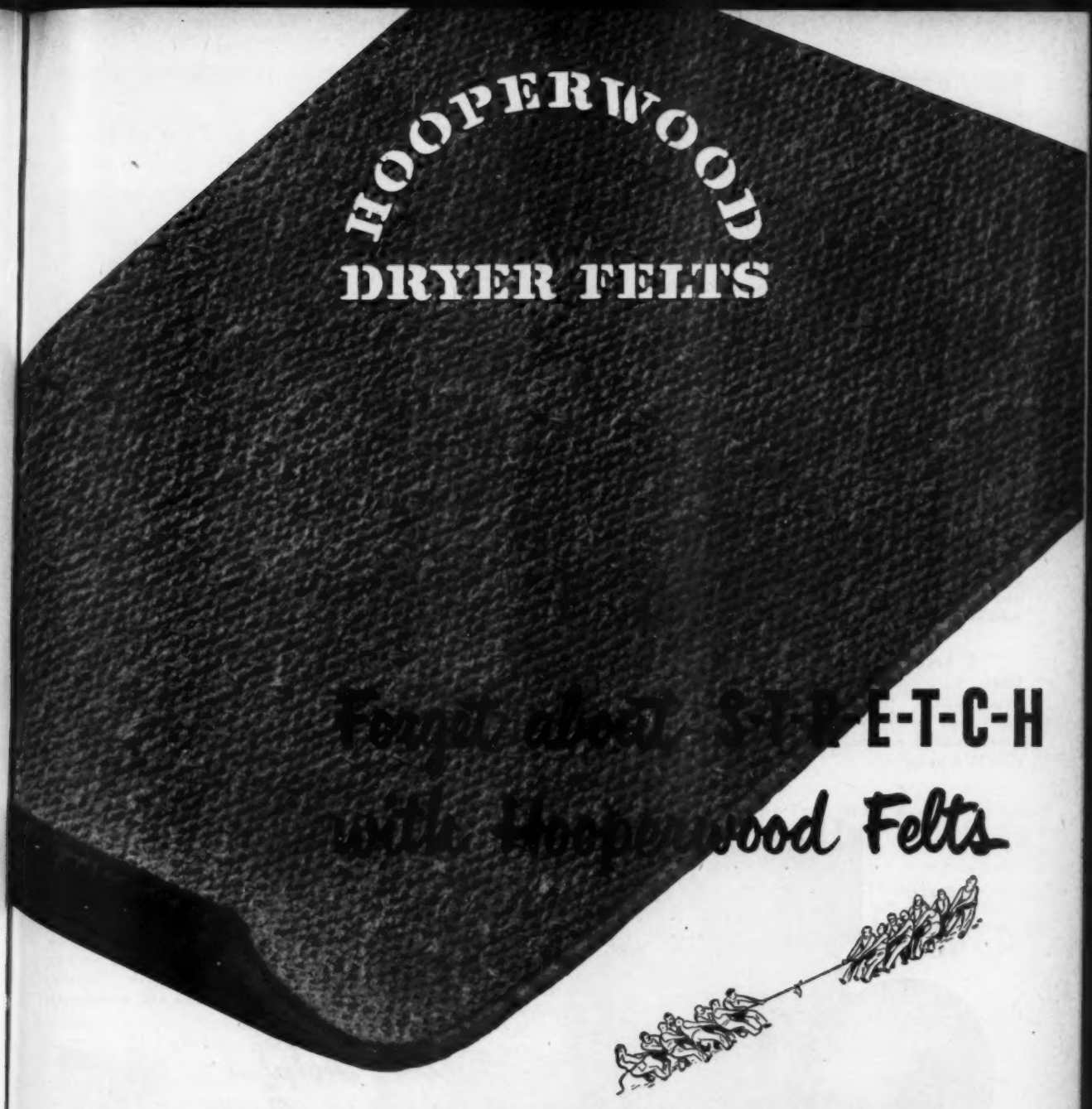
The work of the TVA to convert low-grade hardwood trees and lumber into laminated high-value products will be treated by E. G. Wiesechuegel, TVA, Norris, Tenn., in a talk titled, "Laminated Lumber from Low-grade Hardwoods by the Continuous Glue Press Process."

This session is one of the nine at the FPRS meeting. The sessions will include reports on forest products research, lumber handling, chemical utilization, barking methods, veneer and plywood and allied forestry subjects.

Lake Erie Tappi Choses Schoenberg

William Schoenberg of Lloyd & Schoenberg was chosen 1952-53 chairman of the Lake Erie Section of Tappi at the group's April meeting. D. E. Shotwell of International Printing Ink Co. and R. L. Lewis of Ohio Boxboard Co. were named first and second vice chairmen, respectively.

Other new officers are as follows: secretary, L. E. Rolig, Ohio Boxboard; treasurer, E. F. Burke, Container Corp. of America, and financial secretary, S. B. Gulliford, K. W. Lippert Co. Members of the executive committee are Edward Furlong, Container Corp.; Art Sheeley, Hankins Container Corp.; L. K. Burnett, Ohio Boxboard; Richard Jones, Sinclair & Valentine; C. P. Spring, Chase Bag Co.; John Richmond, Ace Electrotype Co.; Joe Kinney, S & S Cor-



Found after S-T-R-E-T-C-H with Hooperwood Felts

To meet one of the paper maker's serious problems, Hooperwood Laboratories has perfected a *stabilized* felt. *Now*, you can expect your original seam to last as long as the felt. And with stretch under control, the problem of shrinkage in width disappears.

What this means in downtime saved, in production increased, can best be figured out by you. Add to it soft finish, superior drainage, high tensile strength—and you have a dryer felt worth specifying every time.

Hooperwood® Dryer Felts are made in a variety of types and weights, to fit the needs of the paper industry. The one shown here, S/AA, is of asbestos and cotton, ideal for the high-speed production of heavier grades. Consult us for your dryer felt requirements.

WM. E. HOOPER & SONS CO.

General Sales Offices: Juniper & Cherry Sts., Philadelphia 7 • 320 Broadway, New York 7 • 300 W. Adams St., Chicago 6

Hooperwood Mills: Woodberry, Baltimore 11

"Buffalo"

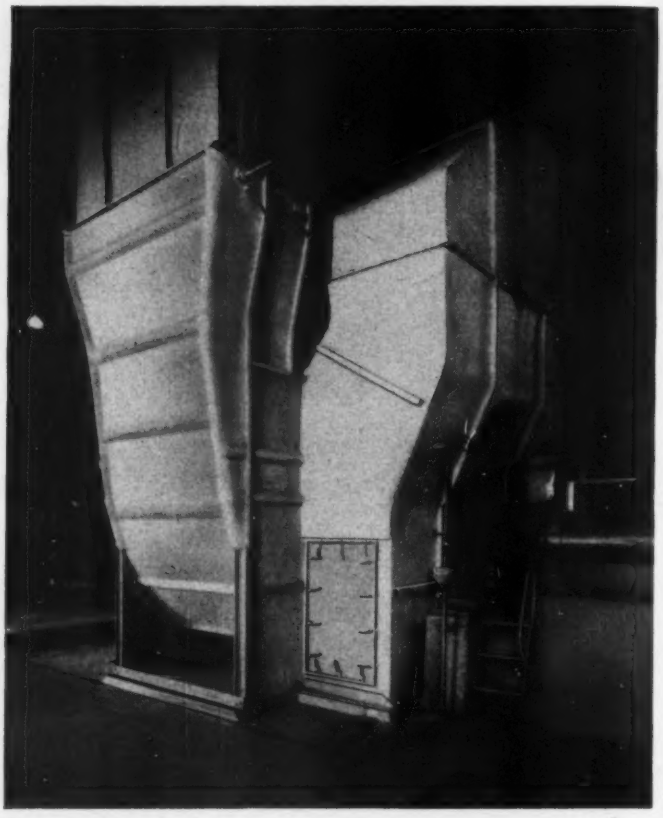
Tips on Better DRAFT Service

1. FAN FOUNDATIONS ON GROUND FLOOR COST LESS than those high up. If necessary to install high up, supporting steel must be adequate for fan weight, fan rotating effect and concrete pad under fan.

2. RIGHT CAPACITY MEANS LONGER FAN LIFE. Too small a fan, overloaded, cannot last, while too large a fan, operating at throttled volume, is inefficient and subject to greater wear and erosion.

3. RIGHTSIZE FAN PARTS INSURE MAXIMUM SERVICE. "Buffalo" Draft Fans, with their heavy rotors, shafts, bearings and housings, bear this out with their records of endurance on the job in every industry.

4. SPECIFY FACTORY-BALANCED ROTORS. Static and dynamic balance mean freedom from vibration. "Buffalo" rotors are balanced at the factory on precision equipment—thus, no time-consuming field balancing is required at the time of installation.



"Buffalo" Induced Draft Fan. Note neat insulation and quick opening access doors.

"BUFFALO" PRIMARY AIR FAN

5. SECTIONAL CONSTRUCTION CUTS COSTS. Bolted sectional housings permit servicing or removal of rotor without disturbing duct connections. This accessibility in "Buffalo" Draft Fans cuts both maintenance time outs and maintenance expense.

Further Helpful Engineering Facts

. . . are yours for the writing, in Bulletin 3750, on draft fans and draft problems. Request your copy today!

"Buffalo" FIRST FOR FANS

BUFFALO FORGE COMPANY

213 MORTIMER ST. BUFFALO, NEW YORK

PUBLISHERS OF "FAN ENGINEERING" HANDBOOK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont. Sales Representatives in all Principal Cities

VENTILATING FORCED DRAFT | AIR CLEANING COOLING | AIR TEMPERING HEATING | INDUCED DRAFT PRESSURE BLOWING | EXHAUSTING

TOURING Beloit Iron Works; to the left in this group is Fred C. Boyce, while Harry Weston is seen at the far right

PANEL DISCUSSION of the wood room and pulp mill finds interest among participants; speaking is Roy H. Kelly of Marathon Corp.

rugated Machine Co.; William Hasselo, Container Corp.; William Manor, Consolidated Paper Co.; Don Schontz, Shellmar Products Corp.; C. J. McDowell, Corn Products Refining Co.; Mike Zales, Great Lakes Box Co.; J. H. Arthur, Nopco Chemical Co., and A. J. Krusick, Paisley Products Inc.

Technical Discussions and Plant Tour Featured by N.W. Supts.

Technical panel discussions on the topics, "Wood Room and Pulp Mill" and "Paper Machines and Finishing" highlighted the 1952 spring meeting of the Northwestern Division of the Superintendents Association, which was held at the Hotel Faust in Rockford, Ill., May 9 and 10. On the second day of the gathering those attending toured the plant of Beloit Iron Works, Beloit, Wis.

The panel selected to lead the discussion on the wood room and pulp mill consisted of Walter A. Sherman, Kansas City Star Co., moderator; John A. McPherson, Mosinee Paper Mills Co.; Lawrence A. Pflieger, Marathon Corp.; Robert J. Gilmer, National Container Corp. The panel selected to lead the discussion on paper machines ad finishing consisted of Leonard Parkinson, Rhinelander Paper Co., moderator; Robert M. Gavin, B. F. Nelson Mfg. Co.; Robert E. Kissel, Hoberg Paper Mills, and Lloyd Hornbostel, Beloit Iron Works.

On the opening day of the meeting, following a morning visit to Woodward Governor Co., Dr. Ivan Stone, dean and head of the Department of Government at Beloit College, addressed a joint luncheon for members and wives. Dr. Stone drew on his experience during 1944-45 with the Department of State and on his years of first-hand observation of international affairs to discuss the topic, "The Resposibilities of American World Leadership."

The tour of Beloit Iron Works on May 10 was the first large-scale industry visit to the plant since Tappi Day in 1946. The guests were divided into small groups, each with a company guide, and toured the foundry, general offices, engineering department, welding shop, machine shops, suction roll floor, bearing storage room, and various erection floor areas.

Highlight of the visit was the laying of the cornerstone of the new dryer shop. Harry Moore, president of Beloit, Paul H. West, chairman of the Division, Fred C. Boyce, first active president of the Superintendents Association, and E. H. Neese, chairman of Beloit, participated in the ceremonies.

Ohio Tappi Elects 1952-53 Officers

C. E. Brandon of Harvard Paper Mills Inc. was elected 1952-53 chairman of the Ohio Section of Tappi at a meeting of the group May 8 at the Hotel Manchester, Middletown. He succeeds H. A. Smith of Mead Corp.

Other officers named at the business meeting are as follows: vice chairman, J. L. Clouse, Oxford Miami Paper Co.; treasurer, R. D. McCarron, Stein-Hall & Co.; recording secretary, G. B. Grigg, Cincinnati Gas & Electric Co.; corresponding secretary, Lee Buechler, Crystal Tissue Co., and executive committeeman, P. S. Cade of Harding-Jones Co., Arthur Thurm of Champion Paper & Fibre Co., D. J. Goodman of Sorg Paper Co., M. G. Lyon of Champion, and Mr. Smith.

RECEIVING THE GAVEL from retiring chairman H. A. Smith, C. E. Brandon (left) prepares to begin his duties as head of the Ohio Section of Tappi

Retiring Chairman Smith expressed his appreciation to his officers and to the section members for their work and cooperation during the past year. Total attendance for the 1951-52 season considerably exceeded that of any previous year.

Southern Paper Trade Assoc.
has announced the election of W. H. Atkinson of Montgomery, Ala., as president. Other officers are: vice president, H. D. Graham, Jacksonville, Fla., second vice president, Jack May, Monroe, La.; secretary, Sara Meredith, Jackson, Miss., and director, Robert Roach, Little Rock, Ark.

Tappi
will hold its sixth annual Alkaline Pulping Conference in Mobile, Ala., November 12 to 14. R. R. Fuller of Gulf States Paper Co., chairman of the conference, expects about 250 to attend.

Corrugated Combiner Conference
will be staged by the Corrugated Containers Committee of Tappi at the Hotel Schroeder, Milwaukee, November 20-21. The first day will be devoted to visits to corrugating plants. On the 21st there will be a meeting devoted to papers and panel discussions based on the committee's combiner questionnaire.

Pacific Coast Division
of the Superintendents Association held a technical session May 23 at Longview, Wash. Papers presented were as follows: "Recent Developments in Paper Machine Design," R. A. Goodwillie, Beloit Iron Works, and "Practical Slime Control in a Specialty Mill," C. T.

STARCHES are discussed by James Casey of A. E. Staley Mfg. Co. at the April 21 meeting of Chicago Tappi

PROGRAM principals gather before the May 19 meeting; they are (l to r): V. V. Vallandigham, A. P. Haake, and Peter Trucano

Beals, Crown Zellerbach Corp. Guest speaker at the dinner was E. G. Swigert, Electric Steel Foundry Co.

Kalamazoo Tappi Presents Second Annual Scholarship

Arne Anderson of Rexton, Mich., a senior at Western Michigan College, has been awarded the second annual Junior Scholarship of the Kalamazoo Valley Section of Tappi. The scholarship carries a $100 stipend and is given each year to the student in the pulp and paper curriculum at the school with the highest scholastic record during his junior year.

The award was made by John R. Dam, section chairman, at the May meeting. The remainder of the program was comprised of brief outlines by seniors in the curriculum of the special projects on which they are working and which form the bases for their theses. They were introduced by Dr. Alfred H. Nadelman, head of the curriculum.

Specialty Papers Discussed at Michigan Superintendents

T. M. Barry, manager of Northern Mills for Hollingsworth & Whitney Co., Waterville, Maine, addressed the March 20 dinner meeting of the Michigan Division of the Superintendents Association, which was held at the Hotel Harris, Kalamazoo. His topic was, "Making Specialty Papers at Higher Speeds."

To accomplish his end, Mr. Barry placed first consideration on the quality of personnel operating the machine. He cited the supervisor, superintendent, assistant superintendent, boss machine tender, and boss beaterman as the key men in the picture. Further, he related that the practical operator and the technically trained man can teach each other a great deal, and that by close cooperation they can solve many problems.

Mr. Barry also stressed the need for proper mechanical maintenance and for proper control over quality and uniformity of the pulp. He likewise touched up a number of operating conditions. He said that where high speeds are desired many operators try to keep the refined stock as free acting as possible, yet still retaining the qualities that will allow them to meet specifications; that the headbox, screens and white water showers can be a prolific source of trouble due to formation of soft lumps, which may cause costly breaks or holes in the sheet; that forming boards and table roll deflectors are now being used extensively, and to considerable advantage, on specialty machines operating at high speeds; that the mesh wire to be used, the forming length, and the pitch of the wire present important problems that are intimately related to the grades made and the machine speeds; that dandy roll drives have found favor in some mills where machine speeds have been increased, and that proper ventilation within the dryer nest is essential.

National Paper Trade Assoc.
at its recent meeting at New York, N.Y., chose as its president for 1952 R. E. Knox, vice president in charge of the wrapping paper division of Knox & Schneider, Chicago. He succeeded E. P. Magel, president of Crescent Paper Co., Indianapolis. Featured speaker at the closing session was George E. O'Connor, president of Mohawk Paper Mills, Inc., Cohoes, N.Y.

Food and Food Containers
was the subject of a symposium staged at the spring meeting of the Association of Consulting Chemists and Chemical Engineers, which was held at the Hotel Belmont Plaza, New York, N.Y., April 22. Members of the panel were to be Dr. Bernard L. Oser of Food Research Laboratories, H. R. Walters of General Foods Corp., Dr. Erwin Di Cyan, consultant of New York, and Nicholas M. Molnar of Molnar Laboratories.

Surface Sizing Panel Held by Chicago Tappi

Printability and other properties of paper are influenced very largely by the surface sizing materials used in papermaking. This was the theme of the panel discussion held during the April 21 meeting of Chicago Tappi. More than 100 were in attendance.

The panel was composed of Warren Kumblad, staff engineer for the Chemical Products Division of Socony-Vacuum Oil Co.; James Casey, in charge of technical service for A. E. Staley Mfg. Co.; Harris Ware, sales supervisor for the Paper Makers Chemical Division of Hercules Powder Co., and Vance V. Vallandigham, Kelco Co.

Section Hears Economist

At the May 19 meeting of the Chicago Tappi section, Alfred P. Haake, nationally known economist, consultant, and mayor of Park Ridge, Ill., addressed the group on the topic, "What's Ahead for Business?" He spoke of the trend toward more and more government control and evaluated the effect that government regulations have on the economy. The speaker stated that our prosperity is not an altogether healthy prosperity, that purchasing power has been reduced 50 per cent, currency has been inflated and savings destroyed.

Mayor Haake further stated that the new generation has adopted the feeling that the government will provide, and that it does not have the zest for adventure that older generations have had. The pioneer spirit is not present.

1952-53 Officers

It was announced at the meeting that Vance V. Vallandigham had been re-elected chairman. Other officers are as follows: vice chairman, C. H. Krebs, Atlas Boxmakers; secretary, J. J. McIntire, H. B. Fuller Co., and treasurer, J. D. Johnson, Container Corp.

McAlary Elected Chairman of CPPA Industrial Relations

D. A. McAlary of Fraser Companies Ltd., Edmundston, N.B., was elected chairman of the Industrial Relations Section of the Canadian Pulp & Paper Association during the section's three-day meeting at Montreal March 11-13. R. S. Armitage of Price Bros. & Co., Quebec, was named vice chairman.

Ninety-two representatives from pulp and paper mills across Canada attended the sixth annual meeting. Retiring chairman and in charge of the gathering was W. F. Cook, director of industrial relations for Kimberly-Clark Corp., Neenah, Wis.

Coming Events

TAPPI meetings

June 19-21—Empire State Section (joint meeting with the Niagara Branch, Technical Section, Canadian Pulp & Paper Association), General Brock Hotel, Niagara Falls, Ont.

June 20-21—Maine-New Hampshire Section, Belgrade Hotel, Belgrade Lakes, Maine.

Nov. 12-14—Sixth Annual Alkaline Pulping Conference, Mobile, Ala.

Nov. 20-21—Corrugated Combiner Conference, Hotel Schroeder, Milwaukee.

American Pulp & Paper Mill Superintendents Association meetings

June 17-19—National meeting, Sheraton-Cadillac Hotel (formerly the Book-Cadillac Hotel), Detroit.

Sept. 18-21—Northeastern Division, Poland Spring House, Polan Spring, Maine.

Oct. 8-10—Southern and Southeastern Divisions (joint meeting), Hotel Roanoke, Roanoke, Va.

Other meetings

June 16-18—International Pulping Conference, Technical Section of the Canadian Pulp & Paper Association, Manoir Richelieu, Murray Bay, Que.

June 18-20—Canadian Pulp & Paper Association, annual summer meeting, Technical Section, Manoir Richelieu, Murray Bay, Que.

June 23-25—Forest Products Research Society, national meeting, Schroeder Hotel, Milwaukee.

June 23-27—American Society for Testing Materials, annual meeting, Hotel Statler, New York, N.Y.

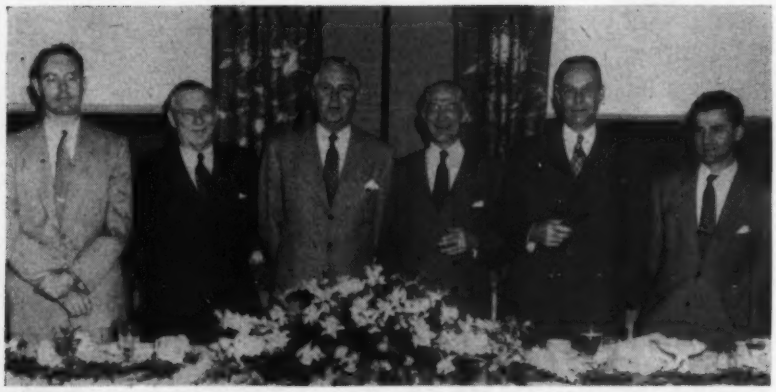
Sept. 4-6—American Institute of Chemical Engineers, regional meeting, Palmer House, Chicago.

Sept. 8-12—Instrument Society of America, National Instrument Conference and Exhibit, Cleveland.

Sept. 9-13—Seventh National Chemical Exposition, Chicago.

K
ONLY NASH VACUUM PUMPS HAVE ALL THESE FEATURES
One Moving Element. Non-pulsating Vacuum.
No Internal Parts In Wearing Contact. No Internal Lubrication. Handles Liquid With Air.
No Expert Attendance. Constant Efficiency.
Low Maintenance Cost.
Plus-
K
NASH ENGINEERING COMPANY
411 WILSON AVE., SO. NORWALK, CONN

The Paper Industry Names in the News



RECENTLY HONORED at a farewell reception and dinner party, five members of the Pulp, Paper and Paperboard Division of NPA who are returning to the paper industry are (l to r): Frank Heyward, T. H. Mullen, John W. Maloney, Lawrence W. Strattner, assistant administrator, Chemical, Rubber and Forest Products Bureau, NPA, L. D. Nicolson and John J. Steinbinder

Five NPA Members Return to Paper Industry

Five members of the paper industry who have served in various positions in the Pulp, Paper and Paperboard Division of the NPA were recently honored at a farewell reception and dinner party. They are as follows: *JOHN WILLIAM MALONEY*, director; *LLEWELLYN DUDLEY NICOLSON*, deputy director; *T. H. MULLEN*, chief, Paper Manufacturing Branch; *FRANK HEYWARD*, chief, Pulpwood Branch, and *JOHN J. STEINBINDER*, chief, Chemical Section.

Mr. Maloney, vice president and sales manager of Hoberg Paper Mills, Green Bay, Wis., joined the NPA in March 1951 as chief of the Sanitary Paper Section, later becoming deputy director and then director of the Pulp, Paper and Paperboard Division. During World War II he was with the Paper Division of the War Production Board for 37 months. Mr. Nicolson, formerly president of District of Columbia Paper Mills, joined the staff of the Pulp, Paper and Paperboard Division in May 1951 as chief of the Wood Pulp Section and later became deputy director. He is returning to industry as assistant to the president of National Vulcanized Fibre Co., Wilmington, Del. During World War II, Mr. Mullen was with one of the war agencies in Washington and later was sent to Hawaii with the War Assets Administration, leaving that agency in 1947 to become associated with Honolulu Paper Co. In October 1950 he became chief of the Paper Manufacturing Branch of the Pulp, Paper and Paperboard Division.

Mr. Heyward came to NPA in May 1951 as assistant to the chief of the Pulpwood Branch of Pulp, Paper and Paperboard Division, later becoming chief. He has served as state forester of Georgia, was first manager-forester of Southern Pulpwood Conservation Association and was in charge of the Southern region of the Pulpwood Section of the War Production Board for two years during World War II. He is currently connected with Gaylord Container Corp. as director of public relations at Bogalusa, La. Mr. Steinbinder, head chemist, of the Riegel Paper Corp., became chief of the Chemical Section of the Pulp, Paper and Paperboard Division of NPA in January 1952.

Six Forest Insect and Disease Consultants Named

Six outstanding men from the field of forestry have accepted invitations to serve as consultants to consider ways of strengthening the U.S. Department of Agriculture's forest insect and disease control activities.

They are as follows: *WALTER DAMTOFT*, assistant secretary, Champion Paper & Fibre Co., Canton, N.C.; *D. CLARK EVEREST*, president, Marthon Corp., Rothchild, Wis.; *ERNEST KOLBE*, forester, Western Pine Association, Portland, Ore.; *FRED H. LANG*, president, Association of State Foresters, Little Rock, Ark.; *DR. A. M. McANDREWS*, professor of forest entomology, Syracuse University, Syracuse, N.Y., and *FRED W. ROEWEKAMP*, city forester, Los Angeles, Calif.

Set up to advise USDA in meeting its responsibilities under the Forest Pest Control Act of 1947, the group includes individuals representative of various phases of forestry from all sections of the country.

Holden New Eastern President

HAROLD H. HOLDEN of Oxford Paper Co. has been elected president of Eastern Corp. He succeeds Clyde Morgan, who went over to Rayonier Inc. several months ago. Mr. Holden was vice president in charge of sales for Oxford. His duties were to be assumed by Andrew M. McBurney, general manager of sales, and Oliver S. Barrie, who has been the Chicago sales representative of both Oxford and Oxford Miami.

H. E. Whitaker

C. R. Van de Carr Jr.

H. E. Whitaker Elected President of Mead Corp.

HOWARD E. WHITAKER, executive vice president of Mead Corp., has been elected president, succeeding *CHARLES R. VAN de CARR, JR.*, who was named director of engineering and chairman of the engineering and development committee.

Mr. Whitaker joined Mead in 1925. He became assistant to the vice president of operations in 1936 and assistant vice president in 1943. In 1946, he was named operating vice president, and executive vice president a year ago. During the war, Mr. Whitaker served with

D. F. Morris

L. R. Growdon

G. H. Pringle

F. T. Shepherd

the War Production Board as deputy director of the Pulp and Paper Division, the combined Production and Resources Board, and the Mission for Economic affairs in London.

Mr. Van de Carr, president since 1948, began his career in his father's paper mill in Stockport, N.Y., later joining the Laurentide Co., Ltd., Grand Mere, Que., where he helped to install the first 1000-foot newsprint machine ever set up in Canada. He became known as the "best papermaker in all of Canada." He supervised the design and construction of the St. Anne Paper Co. mill at Beaupre, Que., for the G. H. Mead interests, which hired him in 1926. When Mead Corp. was formed in 1930, he was elected a vice president, was made executive vice president in 1942.

DONALD F. MORRIS, vice president in charge of operations, was elected first vice president; *LEONARD R. GROWDON,* general manager of the board division, was promoted to vice president in charge of board operations; *GEORGE H. PRINGLE,* chief engineer, was advanced to vice president in charge of white-paper operations, and *FORD T. SHEPHERD,* director of corporate relations, was made vice president in charge of corporate relations. *CYRUS NOBLE MULL,* chief draftsman, succeeds Mr. Pringle as chief engineer. *WALTER HALL* has been appointed power engineer, and *E. J. FADDEN* has been named chief project engineer.

Two Personnel Changes Announced by Scott

EARL ANDERTON has been named plant manager of the Empire, Ore., mill of Coos Bay Pulp Corp., a Scott Paper Co. subsidiary, replacing *HENRY S. GODSHALL, JR.,* who will fill the newly created position of production manager of the Fort Edward, N.Y., plant of Marinette Paper Co., another Scott subsidiary.

Mr. Anderton, a chemical engineering graduate of Massachusetts Institute of Technology, joined Scott in 1932. Since 1949 he has been in charge of wax paper process coordination for Scott's staff technical service at Chester, Pa.

Mr. Godshall, a graduate of Cornell University, began his career with Scott in 1939. In 1950, he was appointed plant manager of Scott's Sandusky, Ohio, plant and became plant manager of the Empire plant a year later.

St. Regis Announces Appointments at New Mill

In connection with the arrival of operating supervisory personnel at St. Regis Paper Co.'s kraft pulp, paper and board mill now under construction at Jacksonville, Fla., three appointments have been announced.

JOHN K. FERGUSON will become resident manager at Jacksonville, while *GEORGE M. SNYDER* continues as resident manager of St. Regis pulp and paper mill at Pensacola. *U. J. WESTBROOK* has been appointed manager of production for the company's southern division, including pulp and paper manufacturing at both Pensacola and Jacksonville. *JOHN A. McDERMOTT* has been appointed general superintendent at Jacksonville, with *E. A. MURPHY* as paper mill superintendent and *ARNOLD HARRISON* as pulp mill superintendent.

Minnesota & Ontario Paper Co. has announced the following personnel additions to its research department: *NEAL I. PAULSEN,* manager of paper development; *WILLIAM H. McPHERSON,* supervisor of paper research; and *GRAHAM B. CROSS,* service engineer, Insulite technical service.

HAMILTON K. PYLES, San Diego, Calif., has been appointed assistant regional forester of the north central forest service region. He will direct all information and educational work for the 14 national forests of the north central region. He now is supervisor of the Cleveland national forest at San Diego.

Worthington Announces Changes In Centrifugal Pumps Div.

Newly created managerial positions in the Volute Pump Section, Process Pump Section, and Multi-Stage Pump Section of the Centrifugal Pump Division of Worthington Corp., Harrison, N.J., were filled recently.

ROY CARTER has been made manager of the Volute Pump Section. With the firm since 1923, he has been in the Division since 1932. *L. H. GARNAR,* who joined the Division in 1930, has been appointed manager of the Process Pump Section. *IGOR J. KARASSIK,* with Worthington since 1934, has been named manager of the Multi-Stage Pump Section.

(Mr. Karassik and Mr. Carter are the co-authors of a series of articles on centrifugal pumps currently running in THE PAPER INDUSTRY.)

Hudson Names Palatka Resident Manager

JOSEPH L. RICHARDSON has been named to the position of resident manager of Hudson Pulp & Paper Corp.'s southern mill, located at Palatka, Fla. George Balko, who previously held the post, has been assigned to special duties at the firm's New York, N.Y., office.

Mr. Richardson joined Hudson in 1946, having been previously associated with Gulf State Paper Corp. Long a prominent figure in the industry, he entered the employ of Yellow Pine Paper Mill at Orange, Texas, in 1911, following which he was employed by Southern Paper Co., Moss Point, Miss. In 1916 he joined E-Z Opener Bag Co. at Braithwaite, La. In 1917 Mr. Richardson was with Champion Coated Paper Co. In 1919, following service in World War I, he rejoined E-Z, serving as a paper machine tender, and was later promoted to night superintendent and assistant day superintendent. In 1928 he was transferred to the firm's mill at Tuskaloosa, where he was subsequently made general superintendent in 1932.

J. L. Richardson

E. R. Burling

ELMER R. BURLING, a vice president since 1946, has been elected executive vice president of Improved Paper Machinery Corp., Nashua, N.H. He is a graduate of Lowell Institute and of Massachusetts Institute of Technology. Before joining Impco in 1935, he was with Schrafft Corp. and Wilbin Corp.

New York Paper Group Elects Officers

HENRY McRORIE, eastern traffic manager of St. Regis Paper Co., was elected president of the Northern New York Paper Group at its fourteenth annual dinner meeting held at Watertown, N.Y.

Other officers chosen include *E. V. DEANS, JR.,* Racquette River Paper Co.,

AN "HONORARY MEMBER" OF THE QUARTER CENTURY CLUB of Beloit Iron Works, Beloit, Wis., because of his important part in developing the kraft paper industry in the south and his close business relationships with Beloit, Adam Rozyskie, from the Georgetown mill of the Southern Kraft Division, International Paper Co., is awarded a diamond pin by E. H. Neese, chairman of the board of Beloit. Seated at the right is Lloyd Hornbostel, Beloit vice president, who also became a member of the Quarter Century Club

vice president, and *ALBERT W. HORR*, Brownville Paper Co., treasurer. *MAURICE C. GOODISON* was reelected secretary.

Members of the executive committee include the elective officers in addition to *V. S. PITKIN*, Brownville Board Co.; *CHARLES HIRSCHEY*, Climax Mfg. Co.; *H. J. WENZ*, Latex Fibre Industries; *F. J. STEPHENS*, J. P. Lewis Co.; *JAMES C. McCORMICK*, Knowlton Brothers Inc., and *WILLIAM MARTIN*, Martin Pulp & Paper Co.

HOWARD W. HILEY of Hoquiam, Wash., has been named to serve as industrial relations manager for Rayonier, Inc., while Lyall Tracy is on leave from that position to serve as director of the Pulp, Paper and Paperboard Division of NPA.

STEPHEN C. MAY has been made Atlanta, Ga., sales agent for Warren Steam Pump Co., Inc., Warren, Mass. The territory includes Georgia, South Carolina, parts of Florida, North Carolina, and Tennessee.

GEORGE N. CARLETON, president of Detroit Sulphite Pulp & Paper Co., is one of 44 Detroit businessmen who are now touring Europe on behalf of the Michigan city. The trip is sponsored by the Detroit Board of Commerce. Its purpose is to publicize the services of Detroit industries.

D. R. BLAIR has been appointed manager of the Pulp and Paper Industrial Relations Bureau in British Columbia. He has considerable experience in industrial relations, having served as chairman of six boards of conciliation. One of these was for the pulp and paper industry's contract with the Pulp, Sulphite and Paper Mill Workers' Union in 1951. He is suspending his own investment and security business, which has been operating for 21 years.

RUSSELL M. HEATH, general manager of the Marinette and Menominee plants of Marinette Paper Co., has been elected to the board of directors of that company.

KINGSLEY F. HARRIS has been appointed to the staff of the Canadian Pulp and Paper Association, Western Division.

JAMES F. ADAMS, president of John A. Manning Paper Co., Troy, N.Y., was a member of the reception committee that was active at Rensselaer Polytechnic Institute May 16 and 17, when the Institute's Industrial Council held a symposium devoted to a study of the oil industry.

FRED W. MORRIS, for many years international vice president of the Pulp, Sulphite and Paper Mill Workers, AFL, has been employed by Hollinsworth & Whitney Co., Boston, as executive assistant, industrial relations.

Worthington Corp., Harrison, N. J., has announced the appointment of *J. P. McARTHUR* as manager of its Philadelphia district sales office, succeeding the late W. J. Daly. Mr. McArthur was formerly regional manager of west coast sales. *H. W. KING*, formerly manager of the San Francisco district office, succeeds Mr. McArthur as regional manager, west coast sales. *P. L. McMANUS*, formerly resident salesman in Portland, Ore., has been appointed manager of the San Francisco district office.

BRYANT W. LANGSTON, president of Samuel M. Langston Co., Camden, N. J., has been named chairman of the board of governors of the Greater Philadelphia-South Jersey Council.

THOMAS H. MULLEN, Alexandria, Va., has been appointed deputy director of the Pulp, Paper and Paperboard Division of the NPA. He has spent 31 years in various manufacturing and sales positions in the paper industry. He was vice president and general manager of the Maui Paper Co., Maui, T. H., before joining NPA as chief of the paper manufacturing branch of the Pulp, Paper and Paperboard Division. (See lead story, page 378, regarding Mr. Mullen's recent retirement as chief of the paper manufacturing branch of the Pulp, Paper and Paperboard Division.)

JACK STEWART, formerly of The Goslin-Birmingham Co., has joined the sales staff of Clark & Vicario Co., Bronxville, N. Y.

FLOYD L. TRIGGS of Riegel Paper Corp. has been named chairman of the exhibitors' advisory committee of the National Packaging Exposition and will have charge of the 1953 show at Chicago.

Dr. C. E. Hartford

J. P. Dailey

Riegel Carolina Corp. has announced that *DR. C. E. HARTFORD* will join the company as vice president. Dr. Hartford for the past 11 years has been connected with Union Bag & Paper Co. and for the past seven years has been managing the Pulp and Paper Division at Savannah. Prior to that he was chief chemist of the Southern Kraft Division. of International Paper Co. at Panama City, Fla. Riegel Carolina has also announced the promotion of *J. P. DAILEY* to the position of production manager. He joined the firm as general superintendent in September and had

WYANDOTTE
CHEMICALS
A call for Wyandotte Technical Service involves no obligation. It may be the means of adding a valuable sales advantage in better coating for one or more of your papers.

Art Radebaugh touches up a drawing depicting the future.

Can this whitest calcium carbonate, PURECAL M, help you sell more paper?

Art Radebaugh, an artist, tells requirements for good reproductions. Read how Wyandotte PURECAL M helps you meet them.

Art Radebaugh, famous artist whose drawings of the future are widely used in newspapers, magazines, books, and advertising matter, says, "Often, I've spent hours changing a job, not to improve the drawing, but to help it to reproduce better on a stock which was either off-white or would not take the ink well.

"You do not need high gloss to make a halftone of a good drawing stand out, but you do need a real white-white paper with a smooth, uniform surface and good inking qualities."

To paper makers

If you want to get the finest finish for your paper, whether for offset or letterpress, use Wyandotte PURECAL* M. It is a pigment of highest purity for paper coating. Because Purecal M is always uniform in quality and in particle size, free of grit and other abrasives, it insures a uniform, smooth coating of high whiteness and hiding power.

A sales suggestion

If your coated papers contain PURECAL M in the coating medium, pass this information along to your sales force. If you are not using it and would like to investigate its possibilities, write us for full application data. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in Principal Cities.* *Trademark

Wyandotte CHEMICALS

For superior quality and uniform performance...

OK BRAND

STARCHES

OK BRAND STARCHES for tub and beater sizing are of highest quality, uniformly maintained.

AT YOUR SERVICE! The Hubinger technical staff and laboratories are widely recognized for their thorough and practical knowledge of the use of starch in making paper. Their experience assures you of the *best* product, *tailor-made* to fit *your specific needs*. Consult us on any production problem —at no obligation, of course.

THE HUBINGER COMPANY
KEOKUK, IOWA • • • EST. 1881

LAMINATES PAPERS, FOILS, CELLOPHANES, TO PAPERS, BOARDS WITH PASTES • GLUES • ASPHALTS

Better bonding...Greater productivity

MULTI-PURPOSE LAMINATOR
for processing paper, boards and cellulose products...

HUDSON-SHARP
MACHINE CO • GREEN BAY • WIS
Manufacturers of
Printers, Embossers, Folders, Interfolders, Waxers, Laminators, Wrapping Machines, Core Winders, Packaging Presses, Crepers and Napkins, Toilet Tissue and Paper Towel Units.

THE all-purpose GL-2 Laminator uses materials direct from parent rolls and rewinds, after laminating with either hot or cold glues and pastes. The machine is so designed that each operating assembly can be readily changed to handle the ever-growing list of new laminants and materials. Completely flexible, it can be rearranged for longer sheet leads . . . new assemblies added . . . or old ones subtracted. Standard 60-inch unit has one hot or cold dryer and is equipped with paste or glue applicator. An asphalt applicator may also be added. Provisions are made for by-passing the sheet so that either of the two applicators can be used with equal facility. Additional drying units can be added to speed production by faster sheet curing if desired. Similar laminators are made for use with wax, crystalines and hot melts. Rewinders and backstands of various types can be furnished. Write for complete details and specifications.

previously been with Coosa River Newsprint Co., Childersburg, Ala.

JAMES E. BYRNS of Springdale, Ohio, has been appointed to the management staff of Gardner Board & Carton Co., Middletown. With the firm since 1949, he will work on special staff assignments in connection with operating problems.

GEORGE E. SCOFIELD has been named assistant resident manager of the Fernandina (Fla.) Division of Rayonier, Inc. He has been with the firm since 1937, when he joined the laboratory staff at the Grays Harbor Division. Mr. Scofield has been chief chemist at Fernandina since 1945. At the same time it was announced that *STEVE RUPERT* had been transferred from the Florida mill to Grays Harbor, where he is to be assistant to the resident manager.

G. E. Scofield

H. A. DesMarias

HUBERT A. DesMARIAS has been appointed general sales manager of Pennsylvania Salt Mfg. Co. of Washington. Formerly Pacific Coast sales manager for General Dyestuff Corp., he will headquarter at Pennsalt of Washington's central office in Tacoma. Before joining General Dyestuff, Mr. DesMarias was in the production department of Chemical Paper Mfg. Co., Holyoke, Mass. He served as the first secretary and treasurer of the Pacific Coast Division of the Superintendents Association, holding this post from 1933 through 1937.

G. L. M. HELLSTROM has been elected president and managing director of Paper Machinery Ltd., Montreal, a subsidiary of Canada Iron Foundries Ltd.

Howard Smith Paper Mills Ltd. has announced that *W. H. WHARTON*, who relinquished his position as chief engineer some time ago because of ill health, is now serving in a consulting and advisory capacity in connection with the firm's engineering program.

MERLE F. SCHREURS has been appointed manager of the new coating research and development laboratory at Industrial Ovens, Inc., Cleveland. He was formerly project engineer for the Vinyl Dispersions Division of the research and development laboratory operated by Texileather, Toledo.

JOHN R. MASON has been made production manager of The Hermon Plug Co., Hermon, N. Y. He was formerly associated in the manufacturing department of Wood Products Co., Brewer, Me.

E. L. OLIVER, JR., vice president-manager, has been appointed executive vice president of Oliver United Filters.

WALTER J. WILKS has been appointed manager of Chase Bag Co.'s Chagrin Falls, Ohio, paper mill. A 34-year veteran in the paper field, he joined Chase as plant superintendent in 1946. Succeeding Mr. Wilks in that post is *HARRY S. PEDLEY*, formerly assistant superintendent.

W. J. Wilks

W. S. Stuhr

WILLIAM S. STUHR, president of United Board & Carton Corp., has been named to the advisory committee of the Syracuse University Institute of Industrial Research.

STANLEY M. HUNTER has resigned as vice president and director of American Hoist & Derrick Co., St. Paul. He joined the sales department in 1936, following more than 17 years with Novo Engine Co., Lansing, Mich.

RICHARD G. CROFT, chairman of Great Northern Paper Co., was recently made a director of American Smelting & Refining Co.

JOHN A. ROBINSON has been named sales manager of the eastern and mid-Atlantic regions for the Industrial Division of Minneapolis-Honeywell Regulator Co. Succeeding Mr. Robinson as industrial manager for the midwest region is *JOSEPH J. MATULIS*.

PATRICK V. LEPORE has been named representative in the northern New Jersey area for E. M. Sergeant Pulp & Chemical Co.'s wholly owned subsidiary, Sergeant Chemical Co.

FRANK A. BREDE has joined Graton & Knight Co., Worcester, Mass., as chief engineer for transmission and development in the Research and Development Department.

C. A. WETLI, vice president of Hudson-Sharp Machine Co., has been made general sales manager and will direct all the firm's sales in the future. He has been associated with the company for the past 23 years and currently is residing in New York, where he is in charge of the eastern territory.

RAYMOND T. DePAN recently joined the technical and sales engineering staff of The Sandy Hill Iron & Brass Works, Hudson Falls, N.Y. A graduate in pulp and paper of the New York State College of Forestry, he was at one time associated with Flintkote Co. In 1947 he joined Downingtown Mfg. Co., where he specialized in development and research on wallboard and stock preparation equipment.

R. T. DePan

D. M. Shapleigh

DAVID M. SHAPLEIGH has been made sales engineer in the Zenith Division of Jackson & Church Co., Saginaw, Mich. Associated with technical sales and service in the paper and pulp and textile industries for 20 years, he was formerly manager of Superba Mills, Inc., Hawkinsville, Ga. At one time he was associated with Brown Co., Berlin, N.H.

COL. ALEXANDER R. HERON, vice president of Crown Zellerbach Corp., was one of the four industry board members who dissented in the controversial decision to recommend a wage boost of 17½ cents hourly plus fringe benefits to the CIO Steel Workers. The paper industrialist said he resigned from the WSB because the steel case was typical of Government policy to use a federal body to arbitrate labor disputes.

RALPH E. HOLT has been promoted to junior maintenance engineer at Gardner Board & Carton Co., Middletown, Ohio. Before joining the firm he was on the staff of Arlington Mills, Lawrence, Mass.

F. T. WHITED JR. and *R. T. MOORE* of Shreveport, La., have been elected directors of Olin Industries Inc.

Mr. Whited was president of Frost Lumber Industries Inc. and Mr. Moore a director at the time that that company's assets were acquired by Olin.

JOHN C. LAPP, manager of methods and systems for National Gypsum Co., has been elected president of the Buffalo, N.Y., branch of the National Office Management Association.

LEO F. THOMPSON has been appointed director of industrial relations for Lunkenheimer Co. He was formerly with Parke, Davis & Co., Detroit.

J. H. McCARTHY has been made chief engineer of the pulp and paper division of St. Regis Paper Co. Within the division, he will supervise the design and construction of new projects, as well as the engineering forces at the firm's various locations.

THOMAS VIRTUE has been named superintendent at the Victory Mills plant of United Board & Carton Corp. Prior to joining the firm in 1951, he was superintendent of Pioneer Folding Box Co., Chicopee, Mass.

Thomas Virtue

J. A. Manley

JOHN A. MANLEY has recently become associated with Lockport Felt Co. as a field representative covering the states of Delaware, Maryland, Pennsylvania, and New Jersey. The territory was formerly handled by W. W. Campbell Jr., now assistant sales manager. Mr. Manley previously represented E. I. du Pont de Nemours & Co., Inc.

W. C. JACOBY has been promoted to dean of the Crown Zellerbach paper school in Camas, Wash. His successor as professor for the second year class is *A. MILES CADY*.

R. O. WEISE has been appointed manager of the Dallas District for Northern Paper Co., Green Bay, Wis. He replaces Harry Parschbacher, who has been transferred to Tulsa.

National Gypsum Co., Buffalo, N.Y., has announced the appointment of General Sales Manager *JOHN W. BROWN* as a top sales executive, reporting directly to the president. To assist him, *WADE W. HILDINGER* was named to the newly created post of assistant general sales manager. *DEAN D. CRANDALL*, vice president previously in charge of general sales, will now devote full time to export, industrial, and contract sales.

WILLIAM MAZER, executive vice president of Hudson Pulp & Paper Corp., and *JOSEPH W. QUARTE*, vice president of National Container Corp., have accepted posts as co-chairmen of the Paper & Paper Products Industry Division of the Joint Defense Appeal.

J. W. Quarte

R. M. Wight

RALPH M. WIGHT has been made director of personnel for Bird & Son, inc., East Walpole, Mass. Mr. Wight, who moves up from the superintendency of the flooring plant, fills the position left vacant by the death in December of Creighton Hill. He became associated with the firm in 1921.

RANDALL A. ROSS of Cornell Paper Products Co., Milwaukee, has been elected to the board of directors of the Folding Paper Box Association of America. Reelected president was *W. RACE*, president of Sutherland Paper Co., Kalamazoo, Mich.

CURTIS M. HUTCHINS has been elected a director of Hollingsworth & Whitney Co. He is president and director of the Bangor & Aroostook Railroad Co.

A. B. CHAVEZ has been transferred from Denver to El Paso, Texas, to head the Denver Equipment Co. office in that city. Associated with the firm since 1940, Mr. Chavez will do field work in the Texas, New Mexico, and northern Mexico area.

WINTHROP R. COREY of St. Louis has been made manager of phosphates and detergents sales for Monsanto Chemical Co.'s Phosphate Division. *JAMES E. CRAWFORD JR.*, also of St. Louis, was named assistant manager.

J. A. SIZER has been elected president of Industrial Gear Mfg. Co., Chicago. He was formerly vice president in charge of sales and succeeds A. M. Scharek, founder of the firm, who has been chosen chairman of the board and chief executive officer.

WILLIAM R. McNALLY has been appointed Link-Belt Co. representative for the pulp and paper industry to succeed H. F. R. ("Bob") Weber, resigned. Mr. McNally, who joined the firm in 1945, will headquarter at the Pershing Rd. plant in Chicago.

RALPH MOSER, executive vice president and sales manager of Carpenter Paper Co., Omaha, Neb., has been elected president of the newly formed Sales Executive Club of the Missouri Valley Area.

MICHAEL A. BROWN JR. has been named sales promotion manager of Rayonier Inc. He was previously with the Plaskon Division of Libbey-Owens-Ford Glass Co., Toledo, Ohio.

C. G. HOWARD of Imperial Paper Co., Albany, N.Y., has been elected to the board of directors of the Capital District Chapter of Delta Nu Alpha, transportation fraternity.

JOSEPH E. MORAN, general sales manager for the Dicalite Division of Great Lakes Carbon Corp., has been elected president of Dicalite Co., a special sales agency for the distribution of Dicalite products in selected areas. Headquarters of both the Dicalite Division and Dicalite Co. are in Los Angeles.

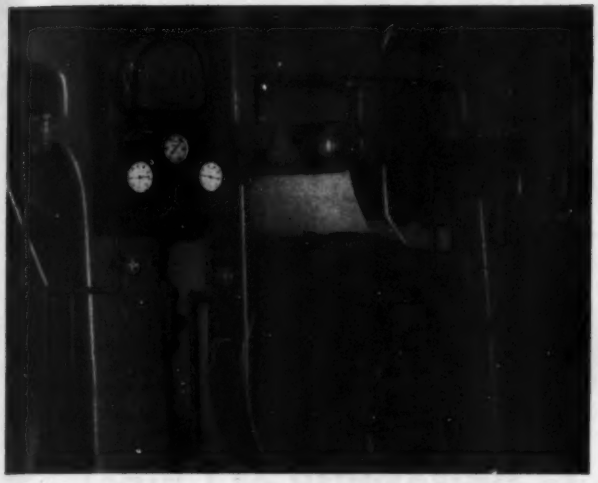
GEORGE J. ZAHRINGER JR. has joined Dow Chemical Co. at Midland, Mich., to assist in the developmental sale of solvents for industrial applications. He was formerly in the sales department of American Mineral Spirits Co., Chicago.

RAY E. HARROUN, West Coast sales manager for A. E. Staley Mfg. Co., Decatur, Ill., has been promoted to the position of assistant manager of the firm's industrial sales department. He has been with A. E. Staley since 1934.

R. E. Harroun

A. F. Welsh

ALVIN F. WELSH, veteran of 25 years' service with Worthington Corp. (formerly Worthington Pump & Machinery Corp.), Harrison, N.J., has received a sapphire-studded pin from A. H. Borchardt, vice president in charge of sales. Mr. Welsh is manager of the reciprocating pump sales department.



Stickle and Lee Combine to Produce *Better* Paper —at a *Better* Price!

Again, The Lee Paper Co., Vicksburg, Michigan, teams with Stickle in the manufacture of fine paper. Stickle Automatic Tension and Thermal Control has been selected for Lee's new No. 3 paper machine (left).

This "team" is not a new one. Six Stickle Steam Controls presently operate for Lee—whom Stickle has been serving since 1915.

Installed on *your* machines, Stickle Automatic Tension and Thermal Control will stabilize steam flow to the machines . . . check over-heating of driers . . . eliminate manual control to the greatest degree. Team with Stickle for cheaper steam—better paper. Send for *free* Bulletin No. 160.

STICKLE STEAM SPECIALTIES COMPANY
2215 Valley Avenue • Indianapolis, Indiana

The famous Lee line includes:

Corinthian • Corsican • Teton • Decor Cover
Vicksburg Vellum • Lee Laurel Vellum
Lee Light Bristol • Lee Script
Asset Bond Vellum • Asset Ledger

The cost-cutting Stickle line includes:

Differential Drainage System • Boiler Return System • Automatic Steam Control • Open Coil Feed Water Heater • Micro Adjustable Orifice Traps • Valves • Sight Glasses

STILL ON THE JOB

After 14 Years!

Thirteen Weldco rolls were installed 14 years ago in a South Carolina Kraft mill . . . . and they're still on the job! The answer lies in the tough outer shell of smooth, polished Monel. For Monel offers greater resistance to corrosion and abrasion . . . reduces friction . . . increases felt life . . . lessens wear on fourdrinier wires.

For your new machine, be sure to specify Weldco rolls. And when you have your old rolls reconditioned, make sure they're covered with Monel!

THE YOUNGSTOWN WELDING & ENGINEERING COMPANY
3721 OAKWOOD AVENUE • YOUNGSTOWN 9, OHIO

"Silver Steel" CHIPPER KNIVES by ATKINS

for Absolute **Uniformity** of Chips!

Proved on the job—in pulp mills throughout America—Atkins *"Silver Steel"* chipper knives deliver the longest runs between sharpenings, grind faster and easier, turn out the most *uniform* chips! . . . Perfectly balanced in sets, made of the finest steel, uniformly hardened and tempered, accurately finish ground to size, they *save you money by serving you better!*

ATKINS
Circular Slitters and Paper Knives

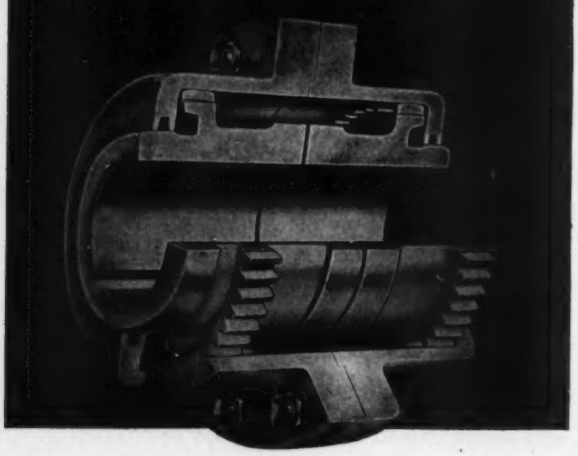
Here, too, *"Silver Steel"* quality has proved its outstanding superiority. Half a century of experience—experience in formulating steel, in fashioning knives best suited for the jobs to be done—has resulted in knives and slitters that—well, they just turn out more work at less cost. We'll welcome your inquiry!

E. C. ATKINS AND COMPANY
402 South Illinois Street, Indianapolis 9, Indiana

ATKINS "ATKINS ALWAYS AHEAD"

USE—*DON'T ABUSE*—*Fine Tools*

POOLE



A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

FLEXIBLE COUPLINGS

POOLE FOUNDRY & MACHINE COMPANY WOODBERRY, BALTIMORE, MD.

PHOTOVOLT
Photoelectric REFLECTION METER

for accurate measurement of

Brightness and Opacity

of pulp and paper in terms of TAPPI specifications. Also for

Gloss and Color

tests on paper, cardboard and other paper products.

Portable, reliable, rugged, simple to operate

PHOTOVOLT CORP.
95 MADISON AVE. NEW YORK 16, N. Y.
Also: Colorimeters, pH Meters

The Paper Industry Safety News

Accident Frequency Rate Down for First Quarter of 1952

Compared with the identical period last year, the three-month frequency rate in the 1952 Paper Industry Safety Contest is down 3 per cent. According to a release of the National Safety Council, more than 150 contestants have maintained perfect scores.

The March frequency rate for all divisions was 8.35, while that for the first three months of the year was 9.23. In the pulp and paper division, the first quarter rate was 9.25, the same as at this time last year. In converting, however, the rate for the period, 9.16, is down 11 per cent from 1951. Firms with perfect records through March are as follows:

Division I—Pulp and Paper Mills

Group A

1—Anglo-Canadian Pulp & Paper Mills, Ltd., Quebec, P.Q., Canada
1—Price Bros. & Co., Ltd., Kenogami, P.Q., Canada
1—Crown Zellerbach Corp., West Linn, Ore.
1—Ecusta Paper Corp., Pisgah Forest, N.C.
1—Brown Corp., La Tuque, P.Q., Canada
1—International Paper Co., Niagara Falls, N.Y.

Group B

1—Price Bros. & Co., Ltd., Riverbend, P.Q., Canada
1—Fraser Paper, Ltd., Madawaska, Me.
1—Rayonier, Inc., Grays Harbor Div., Hoquiam, Wash.
1—Consolidated Paper Corp., Ltd., Port Alfred, P.Q., Canada
1—West Virginia Pulp & Paper Co., Tyrone, Pa.
1—Fraser Companies, Ltd., Edmundston, N.B., Canada
1—Combined Locks Paper Co., Combined Locks, Wis.
1—Bemis Bros. Bag Co., Peoria, Ill.
1—Marinette Paper Co., Marinette, Wis.
1—Racquette River Paper Co., Potsdam, N.Y.
1—Gaspesia Sulphite Co., Ltd., Chandler, P.Q., Canada
1—Rayonier, Inc., Shelton, Wash.
1—Mead Corp., Heald Div., Lynchburg, Va.
1—Southern Paperboard Corp., Port Wentworth, Ga.

Group C

1—Fitchburg Paper Co., Fitchburg, Mass.
1—St. Anne Paper Co., Ltd., Beaupre, P.Q., Canada
1—Marathon Corp., Menominee, Mich.
1—International Paper Co., Southern Kraft Div., Mobile, Ala.
1—Strathmore Paper Co., West Springfield, Mass.
1—National Vulcanized Fibre Co., Newark, Del.
1—Fraser Companies, Ltd., Newcastle, N.B., Canada
1—Riverside Paper Corp., Appleton, Wis.
1—Mead Corp., Sylva, N.C.
1—Abitibi Power & Paper Co., Ltd., Fort William, Ont., Canada
1—Price Bros. & Co., Ltd., Jonquiere, P.Q., Canada
1—American Box Board Co., Filer City, Mich.
1—Manitoba Paper Co., Ltd., Pine Falls, Man., Canada
1—Riegel Paper Corp., Warren Glen, N.J.
1—Building Products, Ltd., Montreal, P.Q., Canada
1—Masonite Co. of Canada, Ltd., Gatineau, P.Q., Canada

Group D

1—Congoleum-Nairn, Inc., Cedarhurst, Md.
1—Certain-Teed Products Corp., York, Pa.
1—Strathmore Paper Co., No. 2 Mill, Woronco, Mass.
1—Certain-Teed Products Corp., Richmond, Calif.
1—Central Fibre Products Co., Tama, Iowa
1—Container Corp. of America, Ogden, Div., Chicago, Ill.
1—U. S. Gypsum Co., Oakmont, Pa.
1—Container Corp. of America, Los Angeles, Calif.
1—Marathon Corp., Ashland, Wis.
1—St. Regis Paper Co., Watertown, N.Y.
1—Strathmore Paper Co., No. 1 Mill, Woronco, Mass.
1—Riegel Paper Corp., Hughesville, N.J.
1—Lloyd A. Fry Roofing Co., Morehead City, N.C.
1—Dexter Sulphite Pulp & Paper Co., Dexter, N.Y.
1—Lloyd A. Fry Roofing Co., Compton, Calif.
1—National Gypsum Co., Garwood, N.J.
1—Lloyd A. Fry Roofing Co., Houston, Tex.
1—Manistique Pulp & Paper Co., Manistique, Mich.
1—U. S. Gypsum Co., N. Kansas City, Mo.
1—American Writing Paper Corp., Nonotuck Div.
1—Lloyd A. Fry Roofing Co., Memphis, Tenn.
1—Lloyd A. Fry Roofing Co., Portland, Ore.
1—Container Corp. of America, Chattanooga, Tenn.
1—Lloyd A. Fry Roofing Co., Summitt, Ill.
1—Lloyd A. Fry Roofing Co., Jacksonville, Fla.
1—Riegel Paper Corp., Riegelsville, N.J.
1—Lloyd A. Fry Roofing Co., N. Kansas City, Mo.
1—National Gypsum Co., Kalamazoo, Mich.
1—Owens-Illinois Glass Co., American Coating Div., Grand Rapids, Mich.
1—Kimberly-Clark Corp. of Canada, Ltd., Kapuskasing, Ont., Canada
1—Container Corp. of America, Wilmington, Del.
1—Central Fibre Products Co., Denver, Colo.
1—National Gypsum Co., Newburgh Plant
1—Quaker Oats Co., Pekin, Ill.
1—Pabco Products, Inc., Felt Mill, Emeryville, Calif.
1—Flintkote Co., Mt. Carmel, Ill.
1—Munroe Falls Paper Co., Munroe Falls, Ohio
1—Abitibi Power & Paper Co., Ltd., Sturgeon Falls, Ont., Canada
1—International Paper Co., Livermore Falls, Me.
1—American Writing Paper Corp., Mt. Tom Div.
1—Fort Wayne Corrugated Paper Co., Vincennes, Ind.
1—International Paper Co., Riley, Me.
1—Volney Felt Mills, Inc., Fulton, N.Y.
1—Johns-Manville Corp., Tilton, N.H.
1—National Gypsum Co., Pryor, Okla.
1—Spaulding Fibre Co., Inc., Hayes Plant, N. Rochester, N.H.

Division II—Paper Converting

Paper Bags

1—Bemis Bros. Bag Co., Houston, Tex.
1—Bemis Bros. Bag Co., Mobile, Ala.
1—St. Regis Paper Co., Seattle Bag Plant, Seattle, Wash.
1—St. Regis Paper Co., Los Angeles Bag Plant, Los Angeles, Calif.
1—St. Regis Paper Co., San Leandro Bag Plant, San Leandro, Calif.
1—Pillsbury Mills, Inc., Wellsburg, W.Va.
1—St. Regis Paper Co., Ltd., Vancouver, B.C., Canada
1—Thilmany Pulp & Paper Co., Kaukauna, Wis.
1—St. Regis Paper Co., Ltd., Dryden, Ont., Canada
1—St. Regis Paper Co., Playa Ponce, Puerto Rico

Boxes and Cartons

Group A

1—F. N. Burt Co., Inc., Buffalo, N.Y.
1—General Foods Corp., Carton-Container Div., Battle Creek, Mich.
1—Container Corp. of America, 35th St. Div., Chicago, Ill.
1—Container Corp. of America, Folding Carton Div., Philadelphia (Manayunk), Pa.
1—Atlas Boxmakers, Inc., Chicago, Ill.
1—Container Corp. of America, Medford, Mass.
1—Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis.
1—National Container Corp., E. Div., Long Island, N.Y.
1—Container Corp. of America, Folding Div., Philadelphia (Manayunk), Pa.
1—Fibreboard Products, Inc., South Gate, Calif.
1—Hankins Container Co., Cleveland, Ohio
1—Old Dominion Box Co., Inc., Charlotte, N.C.

Group B

1—Fort Wayne Corrugated Paper Co., Chicago, Ill.

1—Union Bag & Paper Corp., Savannah, Ga.
1—Ohio Boxboard Co., Corrugated Container Div.
1—Container Corp. of America, Knoxville, Tenn.
1—Hankins Container Co., Union, N.J.
1—Robertson Paper Box Co., Inc., Paper Box Plant, Montville, Conn.
1—Gaylord Container Corp., Atlanta, Ga.
1—Gaylord Container Corp., Carton Plant
1—Fonda Container Co., Inc., St. Albans, Vt.
1—Container Corp. of America, Greensboro, N.C.
1—Gaylord Container Corp., Milwaukee, Wis.
1—Container Corp. of America, Baltimore, Md.
1—Northeastern Container Corp., Bradford, Pa.
1—Green Bay Box Co., Corrugated Div.
1—Southwest Corrugated Box Co., Sand Springs, Okla.
1—Gaylord Container Corp., Jersey City, N.J.
1—Iowa Fibre Box Co., Keokuk, Iowa
1—Container Corp. of America, Lake Shore Div., Chicago, Ill.
1—Hankins Container Co., Chicago, Ill.
1—Southwest Corrugated Box Co., Fort Worth, Tex.
1—Container Corp. of America, Philadelphia (Sixth St.), Pa.
1—Container Corp. of America, Portland, Ore.
1—Container Corp. of America, 57, Los Angeles, Calif.
1—Hankins Container Co., Elmira, N.Y.
1—Bay West Paper Co., Green Bay, Wis.
1—Container Corp. of America, Sefton Fibre, Portland, Ore.
1—Container Corp. of America, Muskogee, Okla.

Roofing Paper

1—Ruberoid Co., Joliet, Ill.
1—Flintkote Co., Chicago Heights, Ill.
1—Certain-Teed Products Corp., Dallas, Tex.
1—Johns-Manville Corp., Marrero, La.
1—Lloyd A. Fry Roofing Co., Stroud, Okla.
1—Flintkote Co., Portland, Ore.
1—Lloyd A. Fry Roofiing Co., Detroit, Mich.
1—Lloyd A. Fry Roofing Co., York, Pa.
1—Lloyd A. Fry Roofing Co., S. Kearny, N.J.
1—Johns-Manville Corp., Los Angeles, Calif.
1—Lloyd A. Fry Roofing Co., Robertson, Mo.
1—Lloyd A. Fry Roofing Co., Waltham, Mass.

Insulation and Building Board

1—Johns-Manville Corp., Jarratt, Va.
1—Armstrong Cork Co., Macon, Ga.
1—Abitibi Power & Paper Co., Ltd., Sturgeon Falls, Ont., Canada
1—Johns-Manville Corp, Natchez, Miss.
1—Armstrong Cork Co., Pensacola, Fla.

Specialties

1—Lily-Tulip Cup Corp., Augusta, Ga.
1—Canadian Cellucotton, Niagara Falls, Canada
1—Old Colony Envelope Co., Westfield, Mass.
1—Marinette Paper Co., S. Glens Falls, N.Y.
1—Kimberly-Clark Corp., Appleton, Wis.
1—Scott Paper Co., Cut-Rite, Sandusky, Ohio
1—Lily-Tulip Cup Corp., Springfield, Mo.
1—Lily-Tulip Cup Corp., French Lick, Ind.
1—Lily-Tulip Cup Corp., Galva, Ill.
1—Lily-Tulip Cup Corp., Brooklyn, N.Y.

MANDO Division Awarded Safety Citation

For the third time in as many years the Insulite Division of Minnesota & Ontario Paper Co., International Falls, Minn., has received the Safety Bureau plaque presented by the Duluth Chamber of Commerce. In accepting the award, Fred E. Boeckh, division production manager, said that the impressive accident prevention record is the result of a high degree of cooperation between management and workers.

Last year the division had four lost-time accidents and a frequency rate of 2.9 accidents for every 1,000,000 man-hours of employment. As a result of this frequency rate, Insulite was awarded the Employers Mutuals of Wausau, Wis., plaque. Its 2.9 rate was the lowest among all pulp and paper mills participating in the contest.

Manistique Pulp & Paper Wins Mead Competition

Manistique Pulp & Paper Co., formerly a division of Mead Corp., has won first place in the George H. Mead Safety Contest for 1951, according to an announcement by G. G. Hentschell, plant manager. The mill had 385,000 man-hours of exposure and 400 accident-free days at the end of the year.

Participating in the contest were 14 Mead divisions. In second place was the Nashville, Tenn., mill. The Brunswick, Ga., mill was third.

Ceremonies were to be held at the Cedar Theater in Manistique, with the award being made by H. E. Whitaker, Mead vice president in charge of operations, and F. H. Wagner, Mead director of safety.

A Survey of Pulpwood Logging operations is to be made by the Pulpwood Logging Div. of the National Safety Council. A questionnaire has been sent to 687 pulp and paper primary memberships to learn the variety and size of operations, as well as to serve as a guide for future safety publication plans. Completed blanks are to be sent to Fred T. Morrish, chairman of the division, Ontario & Minnesota Pulp & Paper Co. Ltd., Fort Francis, Ont.

The Paper Industry Necrology

Col. Hans Lagerloef

Col. Hans Lagerloef, who more than any one other man was responsible for putting Finland on the pulp and paper exporting map, died May 11 in Weehawken, N.J. As representative of the Finnish mills, he developed the American market to what it is today. He was the father of Eric G. Lagerloef of the APPA.

Col. Lagerloef, though a Swede by birth, won business and many other honors in Finland. He ceased business activity in 1939, when the European war made Finnish export trade impossible. Outside the paper industry, he was known as probably the world's outstanding collector of postage stamps.

Thomas H. Stirling

Having served 40 years as resident manager of the Mechanicville, N. Y., plant of West Virginia Pulp & Paper Co., before retiring in 1947, *Thomas H. Stirling,* 73, died May 2 at his home in Loudonville, N. Y.

Mr. Stirling first became associated with the paper company more than a half century ago. He was a member of the board of directors for 18 years and for many years served as a member of the executive committee. He was on the staffs of company plants at Luke, Md., and Covington, Va., before assuming managership of the Mechanicville mill in 1907.

He was a former director of Associated Industries of New York State, Inc., and the Indian River Co. of Albany. He was a leader in civic affairs at Mechanicville, serving for many years as a member of the Board of Education.

John H. Doremus, engineer with Charles F. Hubbs Co., New York paper jobbers, died April 20 at his home in Asbury Park, N. J.

John R. Klin, founder of Rike Paper Products Co. in 1909 and its president until he retired in 1944, died suddenly April 12 at his home in Dayton, Ohio.

Irene Bullock, 72, wife of Warren B. Bullock, manager of the Import Committee of the American Paper Industry,

died May 5 in Long Island City, Queens, N. Y., after having suffered a heart attack while returning from a trip.

Carl Weinhagen, Jr., 61, of St. Paul, Minn., president of Charles Weinhagen & Co., paper box manufacturing firm, died April 8.

C. Webster Mather, president of the Mather Paper Co., Inc., Philadelphia, Pa., died suddenly on May 13 in the corporation's office. He was a member of the Paper Trade Association of Philadelphia and had been in the paper business for 27 years. He was 44 years old.

Peter F. J. Dolan, 54, secretary-treasurer of the Alliance Paper Co., Ltd., Merritton and the Don Valley Paper Co., Toronto, died recently. He was a director of the Ontario Pulp and Paper Makers' Safety Association.

Stanton W. Todd, Sr., chairman of the board of the Central Michigan Paper Co., died recently at his summer home in Silver Creek, N. Y. He was 74.

Bradford C. Gibbs, Sr., of Teaneck, N. J., chief project engineer of the Celanese Corp. of America, died May 5 at his New York office. He was 61.

Whittier E. Horn, president of Peerless Paper Specialty, Inc., of Philadelphia, Pa., and the Saratoga Paper Co., Stillwater, N. Y., died April 24.

Norman Clark, 62, former paper industry chemist associated with the Continental Color Co. and also with the International Printing Ink Co., now a part of Interchemical Corp., died May 12 in a Cincinnati hospital.

Earl D. Power, 56, chairman of the board of Lyon Metal Products, Inc., Aurora, Ill., died suddenly at his home on April 13.

Carl Mellicker, 57, founder and treasurer of Harlem Paper Products Corp., Bronx, N.Y., died March 16.

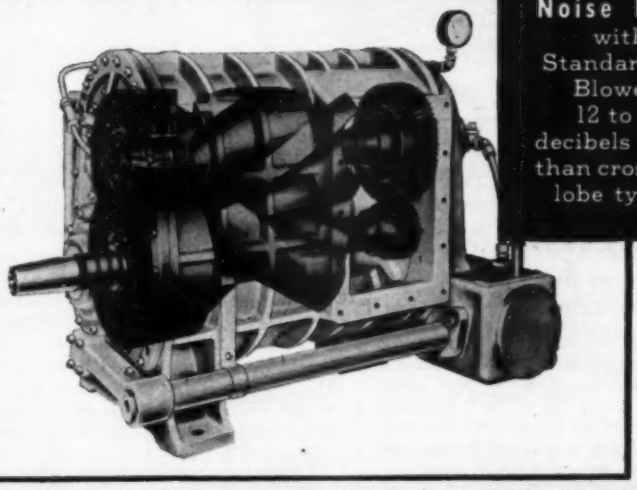
Gerald L. Geis, 48, representative for Schwarz Paper Co., Lincoln, Neb., died March 12.

Howard Marshutz, supervisor of waterproof sales for Bemis Bros. Bag Co., died March 10 in St. Louis.

Miss Edna Roach, vice president of United States Paper Box Co., Philadelphia, died March 14. She was 60.

Wilgus Nutter Dennis, a buyer for Louisville Paper Co. for many years, died in a fire at Chattanooga March 16.

MUST BLOWERS BE LOUD OR QUIET Like a STANDARDAIRE



Noise Level with Standardaire Blowers 12 to 18 decibels lower than crossflow lobe types.

STANDARDAIRE QUIETNESS MEANS LESS WEAR--MORE AIR

IMPARTIAL tests have proved conclusively that Standardaire Blowers with their smooth, gradual delivery action minimize shock and sound pulsations . . . a distinct contribution to quiet operation. Then too, the noise level does not noticeably increase with higher pressures. With the Standardaire principle you squeeze the air gently instead of slapping it . . . a feature that eliminates shock load on the internal parts of the blower. This, of course, means less wear and prolongs service life, even under severe operating conditions.

Write .....
Read Standard Corporation, Dept. F-70, 370 Lexington Ave., New York 17, N. Y.

AXIAL FLOW STANDARDAIRE BLOWER

BLOWER-STOKER DIVISION

READ STANDARD CORPORATION

NEW YORK • CHICAGO • ERIE • YORK • LOS ANGELES

Foreign Abstracts . . . . . .

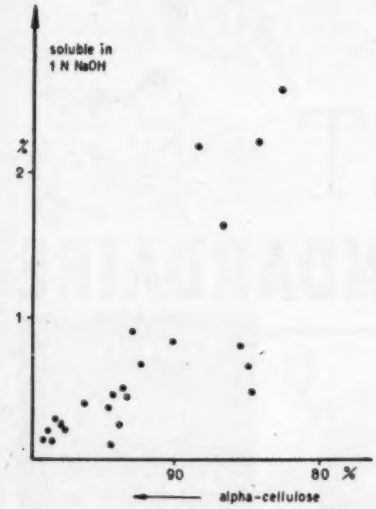


Fig. 1. The relationship between alpha-cellulose content and the solubility in 1.0 N alkali, for the pulps

Material	Alpha-Cellulose % (CCA 7 and 10)	Beta-Cellulose % (CCA 7 and 10)	Gamma-Cellulose % (CCA 7 and 10)	Soluble in 1.0 N NaOH,%
Technical pulps:				
Prepared from textile cuttings				
a) under uncontrolled conditions	96.5	3.5	0.2	0.40
b) under controlled conditions	99.1	0.9	0.2	0.15
Prepared from old cotton rag				
a) under uncontrolled conditions				
rag quality I	90.3	—	—	0.83
rag quality II	92.5	7.0	0.4	0.67
b) under controlled conditions				
rag quality I	93.7	5.0	0.4	0.50
rag quality II	96.9	3.1	0.1	0.14
Filter paper:				
No. 1	98.8	0.6	0.6	0.21
2	98.0	1.6	0.3	0.25
3	98.3	1.2	0.3	0.29
4	94.4	4.6	0.7	0.46
5	93.1	5.0	1.4	0.90
6	84.2	12.8	2.3	2.20

Table I. Analysis data for a number of different types of pulp and paper

Resistance of filter paper to aqueous (alkaline) solutions

In assessing the resistance of filter paper to dissolution, the following technique was adopted. Carefully weighed filter paper (4.0 g. dry weight ± 1 mg.) is treated with 150 ml. of *1N* (carbonate-free) sodium hydroxide in a gasketed bottle (160 ml.) provided with a Bakelite screw cap, using glass beads for purposes of disintegration—and to raise the level of the mixture exactly to the rim of the container. The bottle is then rotated slowly (25 rpm) for 2 hours, the suspension filtered through a sintered glass filter (Jena, G1), and the filtrate mixed with very small amounts of the filtered fiber and then centrifuged 10-15 minutes at 2500 rpm. The centrifugate is then refiltered through a Pyrex F filter. The solution should then be clear.

The filtrate (25 ml.) is pipetted into a flask containing a mixture of 5 ml. 0.4 *N* potassium dichromate and 75 ml. concentrated sulphuric acid, cooled at least to *room temperature.* (A blank is also run using the original extraction solution and the reagents.) Each mixture is heated 30 minutes in a boiling water bath. The solution (in each case) is transferred to a low 400 ml. beaker and the flask rinsed with 150 ml. distilled water. This mixture is then cooled and 25 ml. of 0.1 *N* ferrous ammonium sulphate are added. The excess of ferrous ions is titrated back with 0.1 *N* permanganate solution; the end point is determined potentiometrically.

The following calculation shows the *amount of substance* dissolved from the initial sample.

$$\text{Dissolved } (\%) = \frac{101.25^{*}(a\text{-}b)^{*}N}{V^{*}G}$$

where a = $KMnO_4$ consumed in ml., *N* = normality of this solution, b = $KMnO_4$ consumed in the blank, V = volume of filtrate used in sample, and G is the *dry weight* of the original cellulosic sample. The standard deviation is ± 0.02 per cent of the dissolved substance or, for higher values, about 1-2 per cent of the correct value.

Results for a number of different types of paper are given in Table I. In general, when the alpha-cellulose content is high, the solubility in 1 per cent, NaOH is always low. However, there are a few cases (as seen from Fig. 1) in which the alpha content is relatively low, and the alkali solubility is also well under 1 per cent. This figure gives all the results obtained in this study (i.e., more data than are given in Table I). Thus, it is well *not* to use the alpha cellulose determination as a criterion of whether or not a filter paper is resistant. Direct solubility should be determined. Twelve references. Hans Wilhelm Giertz and Gunnar Gran. *Svensk Papperstidn.,* **55,** 38-43 (1952).

Tall oil pitch in paper sizing

The pitch (I) obtained in relatively large amounts (25-30 per cent) distilling tall oil has been explored with a view towards its use in paper sizing. The results appear encouraging, when I is fully saponified. Under these conditions it resembled Dethirna size, but it is essential that saponification be complete, otherwise "pitch troubles" and wire plugging result.

A method was developed for preparing paper size from (I) (delivered from the Swedish sulphate mill to Bergvik), and brief descriptions are given. The method of sizing can be used in combination with Yankee and cylinder machines. The method may obviate importation of quite a portion of imported dark wood resin, which can be replaced with this less expensive domestic product. Tage G. Sunnberg. *Svensk Papperstidn.,* **55,** No. 1, 15-18 (1952). [(In Swedish) through *Bull. Inst. Paper Chem.* **22,** No. 7, 5-11-12 (1952).]

Carboxyl distribution in the cell walls of wood holocellulose

The investigation sought to determine the distribution of carboxyl groups in three different fibrous materials (I) the holocellulose from sprucewood, (II) the holocellulose from birch, and (III) the cotton fiber. In each case, the distribution was determined by means of a microspectrographic technique [cf, Lange, *Svensk Papperstidn,* **53,** 749 (1950)]. The fibers were treated with the colorless carbinol base of crystal violet. As a result the cell walls are stained, presumably due to salt formation.

In the case of I and of II, the carboxyl is distributed approximately linearly. The concentration is highest in the outer layers of the cell wall and approaches the vanishing point near the lumen.

A different picture is presented by carefully purified III. Here, too, the concentration is highest in the primary layer, but throughout the rest of the cell wall the carboxyl group concentration is exceedingly low (*i.e.,* there is a sharp diminution in such groups—not a gradual decrease as in the case of I and II, and so the carboxyl groups in III appear localized in the outer wall). These distributions of carboxyl groups may be correlated with the distribution of hemicelluloses, which also occur linearly distributed in wood. Saara Asunmaa and Paul W. Lange, *Svensk Papperstidn.,* **55,** 217-222 (1952). (In English.)

Rice straw pulping

Experiments in soda pulping Egyptian rice straw (obtained from rice grown on the Nile Delta) were carried out at the Chemical Technological Institute of Farouk University, in Alexandria. This straw appears to be the most essential and practical cellulosic raw material of the Egyptian pulp industry (since wood is missing, bagasse is unsatisfactory, cotton is too costly, and wheat and flax straws are used by the farmers and are not available to pulp mills).

The rice straw (I) (analyzed in triplicate) contained: 18.3 per cent ash (of which almost 90 per cent was silica); 13 per cent hot water, 5.4 per cent alcohol-benzene and 0.7 per cent ether extractives; 38.3 per cent alpha-cellulose; 11.8 per cent lignin; and 31.6 per cent hemicelluloses. I was digested with caustic soda under a variety of conditions, and, apparently, the soda process was more satisfactory than was the Kraft process. When I was digested 4 hrs. with 3 per cent NaOH (using a ratio of 15 parts alkali to 100 parts I) at temperatures ranging from 60C. to 170C., it was found that maximum lignin removal took place at about 100 deg., although both alpha-cellulose and hemicelluloses decreased almost linearly with increasing temperatures. The lowest silica and ash contents were noted at 100

More Important Than Ever
H & K
Perforated Screens

H & K Perforated Metal screens for the paper industry (bull, chip and pulp screens, digester bottoms, etc.) will give you the assurance of uniform hole sizes and spacings, smooth easily cleaned surfaces, a wide choice of metals and alloys for your particular application, and maximum strength for long service. They are furnished in standard or special patterns, and may be fabricated (rolled, formed, welded, brazed, etc.) to your specifications. Our Catalog No. 62 contains a wealth of screen information—write for your copy.

Also remember — H & K Standardized Guard Parts for sturdy belt and machine guards at a saving.

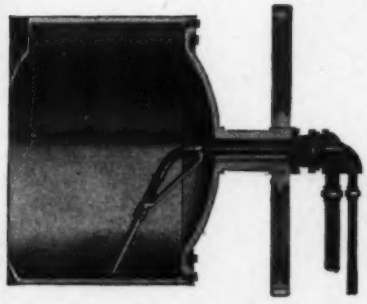
The Harrington & King Perforating Co

5654 Fillmore Street Chicago 44, Illinois
114 Liberty Street New York 6, New York

Double Barrel Reason

Reaction of ¾" Auto-Flex in 48" dia. dryer. Very low leverage.

Reaction of ¾" ordinary bent pipe. Syphon in 48" dia. dryer. High leverage.



for using Midwest Auto-Flex Syphons

Midwest Auto-Flex syphons have been on the market for years and many thousands are in service for two very excellent reasons—they hold their position—they wear indefinitely.

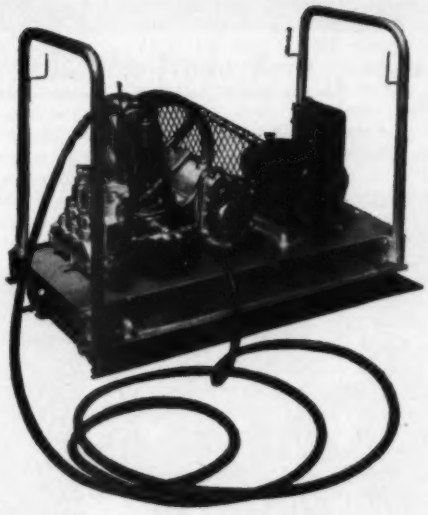
1. The spring and brace holds the end of the pipe at the proper distance from the bottom of the dryer. It cannot possibly take any other position — hence, proper water and air removal.

2. The cantilever leverage exerted is lower than with bent pipe syphons, only 170# vs 354#. It clears instead of dragging on the journal and rapidly wearing out.

Order a get acquainted dozen. Performance as stated guaranteed.

Midwest-Fulton Machine Company Dayton • Ohio

FARQUHAR Portable HI-PRESSURE CLEANER



CUTS CLEANING COSTS for

- *Industrial Plants*
- *Food Processors*
- *Packing Plants*
- *Dairies*
- *Hospitals, Institutions*
- *Chemical Plants*
- *Public Buildings*
- *Paper Mills*

IF you have a cleaning problem, here's the most efficient and economical way to solve it! This completely *portable* Farquhar Hi-Pressure Cleaning Unit sweeps away accumulations of process refuse, residue, debris, or any other kind of dirt from walls, floors, vats, belts, machinery, etc., *with high velocity jet of hot or cold water at 300 to 500 p.s.i.* Ideal for cleaning in cracks, corners, other out-of-the-way places. Saves time! Saves money! Available in 10 gal. per min. size for 1 gun or 20 gal. per min. for 2 guns operating simultaneously.

Write *now* for complete information on how this amazing Farquhar Hi-Pressure Cleaning Unit can do your cleaning job *faster, better, cheaper!* Address: A. B. FARQUHAR Co., Special Machinery Department, 1217 Duke St., York, Pennsylvania.

Farquhar
HI-PRESSURE CLEANERS
JUICE PRESSES • SPRAY COOLERS • PASTEURIZER COOLERS
CONVEYORS • TRIMMING TABLES • HYDRAULIC PRESSES

A. B. FARQUHAR CO., Division of THE OLIVER CORPORATION

deg., after which both rose markedly with rising temperature.

Maximum (II), burst (III) and tensile strength (IV) were shown by pulps formed at 120 C. II, III, and IV all showed sharp decreases when the pulps had been obtained at 140 deg. When pulping was carried out as above, at 120 deg., but for varying time periods, two optima became manifest, after 0.5 hour, and at 3-4 hours, at which lowest silica and ash values were obtained.

Digestion time did not alter III or IV, but II was highest when the cook lasted 4 hours. When alkaline solutions ranging from 1 per cent—5 per cent were used, the pulp and alpha-cellulose yield actually increased, as did ash, silica, and lignin. By varying the ratios of NaOH to I (but using 1 per cent NaOH at 120 deg.), the percentage of hemicellulose remained constant throughout, but pulp yields, ash, and silica decreased sharply, whereas lignin and alpha-cellulose decreased more gradually (in the latter case until the NaOH: I ratio was 4:25).

When I was digested with 3 per cent NaOH (ratio of NaOH I 1:6.66) 3 hours at 110 deg., followed by a second digestion of 2 hours at 170 deg., the percentage of silica rose from 0.39 (at the end of the first stage) to 8.26 (at the close of the second stage). I, cooked 4 hours with 1 per cent NaOH at 120 deg., retained about 2 per cent lignin and 0.29 per cent silica, but when the supernatant liquor was concentrated to 3 per cent NaOH, the resulting pulp contained 2.76 per cent lignin and 3.98 per cent silica.

It is evident that, at higher cooking temperatures, both lignin and silica are reabsorbed on the fiber. Eight graphs are included. K. Lauer and Abdel Fattha M. Ghoneim. *Wochbl Papierfabr.*, 80, 211-214 (1952). (In German).

Wet-strength boards for packaging

The author points to the lack of definition, critical testing procedures for evaluating water repellency, wet-strength and water-proofness of boards. Handmade binders board, container board, leatherboard, and laminated board are considered.

Beater and surface sized boards were those treated with one or more of the following: rosin, wax, bitumen, tars, water glass, starch, cellulose derivatives, and various synthetic resins (I). Absorptivity of water was measured by immersing a weighed sample (10 x 10 cm.) for 0.5 hour or 3 hours in water followed by weighing. The degree of swelling (II) can be measured on the same sample by calipering. These values must be supplemented by dry- and wet-strength properties (e.g., burst). II gives an indication of the adhesive requirements: high II shows the need for concentrated glues containing little water.

The influence of hardness in water, dyes, drying temperatures and thickness of the board (under various conditions of sizing) are discussed. Calendering appears detrimental, and when a certain caliper is required, repeated passage of a sized board between calender rolls may nullify the effects of sizing altogether.

The favorable influence of II on wet-strength is discussed, but for most German specifications natural sizing agents are adequate. Martin Müller. *Wochenbl. Papierfabr.*, 79, 543-5; 575-8 (1951). (In German).

Effect of temperature on beating of chemical pulps

The pulps used in this study were easily hydrated, so-called "simili sulfurise" (I) (used in making imitation parchment) and dissolving pulps (II) used in rayon manufacture. A limited number of experiments were also made with a kraft pulp (III).

In the hydrations, which were carried out in a valley beater, the temperatures were respectively, 4, 40 and 70 C. In general, the temperature effects were far more marked in the case of I, than with II or III. For pulps of type I, parchmentization was reached far earlier at 4 than at 70 C. Other results, which are given in great detail, may be summarized as follows: within a definite beating period the degree Schopper-Riegler (S-R) reached is greater at 4 than at 70 C. When beaten to the same degree S-R, fibrillation is more pronounced at 4 than at 70 C.; even though in the former case, the beating period was shorter. The differences are shown in Figs. 1 and 2.

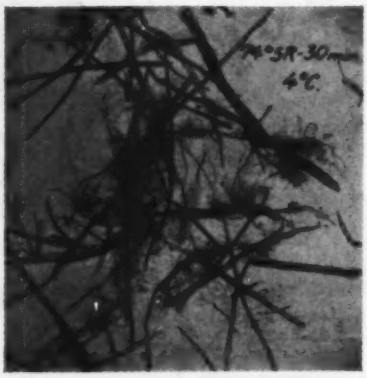


Fig. 1

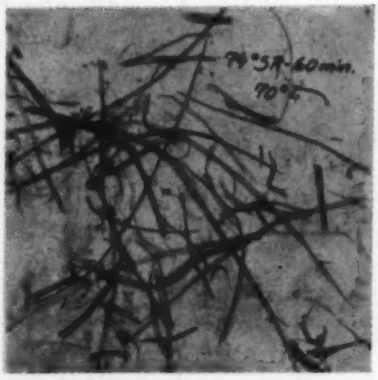


Fig. 2

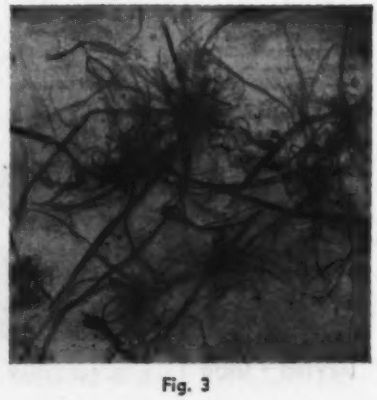


Fig. 3

With pulps of type I, fractionation was more difficult when beaten at the lowest temperature. The pulp fraction (cf. Fig. 3), held by a Bauer screen No. 20, showed a S-R deg. of 72, when the entire pulp was beaten to 90 deg. S-R, and this fraction amounted to 21 per cent. Furthermore, on screen No. 35, 13.8 per cent (S-R, 55 deg.) and on screen No. 65, 17.5 per cent (S-R, 49 deg.) were held. The author emphasizes the false conclusions that may be reached from such fractionation and discusses what may be a more rational fiber separation (possibly in the domain of ultracentrifugation). Eleven graphs and 8 photomicrographs, but no references are given. E. Stephansen. *Bull. assoc. tech. de l'ind. papetiere.* 5, No. 7, 350-365 (1951). (In French).

Copper in pulp and paper

The biscyclobexanone reagent C_6H_{10}:N•NHCO•CO•NH•N: C_6H_{10} (I), according to Nilsson, [*Acta Chem. Scand.*, 4, 205 (1950)] is very sensitive in detecting very small amounts of copper, giving a blue coloration in weakly alkaline solution. The purpose of the present work was to test the usefulness of this reagent for the quantitative determination of small amounts of copper in pulp and paper. The following solutions were used: (1) I (0.1 g.) in 20 ml. 50 per cent alcohol, (2) various strengths of $CuSO_4$•5 H_2O in H_2O ranging from 2.24 gammas to 112 gammas per ml. of water and (3) a solution of NH_4Cl adjusted to pH 8.5 with NH_4OH.

By mixing various volumes of solution (2) with 0.5 ml. of reagent I [in (1)] and 2 ml. buffer solution (3) and diluting to 25 ml., it was shown consistently that the maximum absorbency (in a Beckman Spectrophotometer) was obtained at a wave length of 595 μ. When absorbency at this wave length was plotted against the weight of copper (in gammas), a linear relationship was obtained. Reproducible and consistent values were obtained within the pH range of pH 6.9 to 9.9 (above which the color faded rapidly). Below this pH range, the values were also low and not reproducible. Measurements are interfered with by metals which precipitate in alkaline solution (i.e., iron, aluminum and manganese), but if a suitable complex-forming agent (e.g., citric acid) was used, precipitation was prevented and absorbency was not interfered with.

Under proper conditions the following ions did not interfere with the copper determination: Al^{+++}, Ca^{++}, Co^{++}, Fe^{+++}, Hg^{++}, Mg^{++}, Mn^{++}, Ni^{++}, Pb^{++}, Zn^{++}, Cl^-, ClO_4^-, CrO_4^{--}, MnO_4^-, NO_3^-, HPO_4^{--}, SO_4^{--}, and $CH_3CO_2^-$.

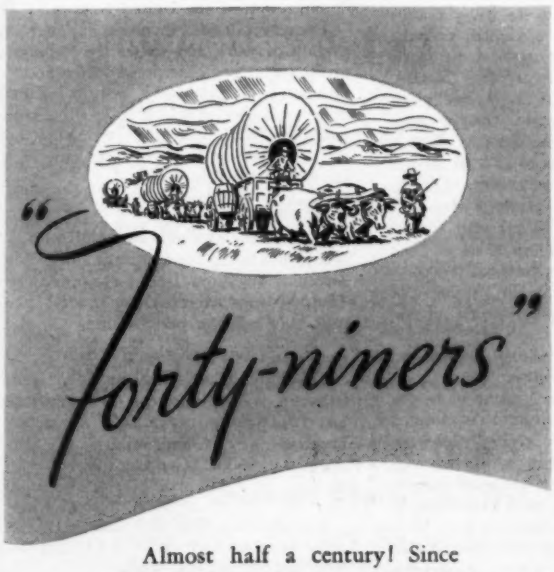
In carrying out the determination on pulp, 10 g. of sample were added to a 200 ml. Erlenmeyer flask, fitted with a suitable air condenser. Then, 30 ml. fuming nitric acid were added, and the mixture warmed to effect solution. This was followed by

Oriskany WATERBURY FELTS

In paper mills where high production and rigid specifications must be maintained, Oriskany Waterbury Felts are consistently meeting the precise requirements for every type of paper . . . on a wide variety of equipment!

H. Waterbury and Sons Co.

Oriskany, New York



Almost half a century! Since 1903 — quality Fourdrinier wire cloth for the paper industry.

THE LINDSAY WIRE WEAVING COMPANY
CLEVELAND 10, OHIO

Lindsay WIRES
FOR PAPER MILLS

The Only... FABRI-VALVE

FABRICATED ALLOY VALVES

Look for this Trade Mark → FABRI-VALVE

Accept no substitute

THE VALVE THAT MEETS YOUR SPECIFIC NEED

Save ON ORIGINAL PRICE, INSTALLATION and SHIPPING COSTS

FABRI-VALVES are complete weldments from rolled plate, thus eliminating any porous areas and insuring proper thicknesses where designed and are therefore superior to cast types.

Designed to control the flow of heavy paper stock and liquor solutions with a minimum of maintenance. Made from all types of stainless steel, monel or any combination. Contact nearest agent.

Sizes 2" to 24" in stock.
Special orders in 30 days.

AGENTS:

SOUTHERN CORPORATION, Charleston, S. C.
M. J. GIGY & ASSOCIATES, San Francisco, Cal.
JOHN B. ASTELL & CO., New York, N. Y.
NORTHWEST COPPER WORKS, Inc., Portland, Ore.
THOS. W. MacKAY & SON, Ltd., Vancouver, B. C.
CHANDLER BOYD CO., Pittsburgh 19, Penn.

FABRI-VALVE CO. OF AMERICA
2100 N. Albina Ave., Portland 12, Oregon

ALL SIGNS POINT TO

CHICAGO ELECTRIC

For ELECTRICAL POWER EQUIPMENT

AC MOTORS
DC MOTORS
GENERATORS
M.G. SETS
CONVERTERS
COMPRESSORS
SWITCHBOARDS
TRANSFORMERS
CONTROLS
HOISTS

• Rebuilt

We carry large stocks of all types of guaranteed rebuilt equipment. Units of every size and description to fill your requirements.

• New

As stocking distributors for leading manufacturers of electrical power equipment, we offer you a wide choice, local stocks and prompt delivery.

• Repair

Our repair and rebuilding facilities are of the finest in the country. When you need help to keep your plants running and producing be sure to call.

PHONE CANAL 6-2900

CHICAGO Electric Co.

1323 W. CERMAK RD.
CHICAGO 8, ILL.

Use Anthrafilt*

To Solve Your Filter Problems

1. Increase your filter plant output without increasing the size of your present plant.

2. ANTHRAFILT, the hard coal filter medium, will increase rates and lengths of filter runs.

3. Weighing only about one half as much per cubic foot as other types of filter media ANTHRAFILT backwashes at lower rates.

4. Being essentially a carbon you can filter sanitary supplies, hot or cold process water or acid and alkaline solutions.

Many paper mills in all sections of the country now use ANTHRAFILT exclusively. Why not write us today for full details, test samples, recommendations and quotations?

PALMER FILTER EQUIPMENT COMPANY
822 East 8th St., P. O. Box 1655
Erie, Pennsylvania

Representing

ANTHRACITE EQUIPMENT CORPORATION
Anthracite Institute Bldg.
Wilkes-Barre, Pennsylvania

*Trade Mark Reg. U. S. Patent Off.

evaporation to about 10-15 ml., and 1.5-2 cc. of concentrated sulphuric acid were then added. Evaporation was continued, and if necessary, more nitric was added until the solution no longer darkened. Finally, a few drops of perchloric acid were also added and the temperature was raised to the boiling point (but only 0.5 to 1 minute). The mixture should be nearly colorless (or very faintly yellow-green).

The cooled solution was rinsed out of flask (and condenser) with water, and the combined solution titrated with strong caustic soda (50 per cent) until only faintly acid. The mixture was evaporated to 15 ml., filtered into a 25 ml. volumetric flask (through a filter washed with aqueous H_2SO_4) and filled to the mark with acidulated rinsings. To *another* 25 ml. flask, 20 ml. of the solution were transferred; 05 ml. of a 10 per cent ammonium citrate solution was added, together with one drop of "Neutral Red" indicator and 3 drops of NH_4OH. The ammonium salts buffer the solution. Then, 50 per cent sodium hydroxide was added dropwise until the color changed to very faint yellow. Thereupon, 1 ml. of reagent I (1) was added, and the solution made up to volume, and the absorbency measured at 595 μ.

High concentrations of ammonium salts caused serious errors, but reasonable amounts of sodium sulphate had little effect (especially when the absorbency was measured promptly). Carl-Ulrik Wetlesen and Gunnar Gran. *Svensk Papperstidn.*, **55**, 212-216 (1952). (In English.)

The alkali solubility of pulp

The solubility of pulp in caustic soda of varying concentrations up to 18 per cent has been determined for a number of pulp samples. The solubility appears to reach a maximum at about 10 per cent NaOH, at which the solubility of the beta-cellulose of the pulp is at a maximum. On the other hand, the solubility of the gamma-cellulose increases continuously up to at least 20 per cent NaOH, and the solubility of beta-cellulose in 18 per cent caustic is very low. Thus, the solubility in 18 per cent NaOH is a measure of the gamma content of a pulp, and the differences between the solubility in 10 per cent and in 18 per cent NaOH is an approximate measure of the beta-cellulose content.

The original wood contains no beta but rather much gamma-cellulose. During the cook a part of the gamma-cellulose is dissolved, whereas beta-cellulose is formed from the alpha-cellulose originally present. Thus, a pulp which has been digested vigorously (to low viscosity) has a low gamma content, but a relatively high beta content.

During a bleaching operation very little gamma cellulose is removed, but if the bleaching operation is extensive, some beta-cellulose is formed. Thus, from the solubility values obtained in 18 per cent and in 10 per cent NaOH certain conclusions can be drawn regarding degradation during the cook or during bleaching.

The nature of beta-cellulose depends on the cellulose structure. A pulp sample which has been dissolved and then reprecipitated has a far higher beta-cellulose fraction (with a higher D.P.) than had the original pulp. Furthermore, if a pulp is first wet with water, and enough NaOH is then added to make a 10 per cent caustic solution, the apparent beta-cellulose content is higher than when the pulp is treated directly with 10 per cent NaOH. Beating causes a marked increase in the beta fraction, and during the aging of alkali cellulose, appreciable amounts of the beta fraction are formed (having a D.P. approximately equal to that of the beta-cellulose in the pulp prior to aging).

If the beta-cellulose content of a pulp is considered *not* to have a great effect on rayon (or other cellulose conversion product), the ordinary alpha-cellulose determination is misleading in judging pulp quality and cannot give an idea of the yield to be expected. If, on the other hand, the beta-cellulose content is considered important, then the solubility in 18 per cent NaOH and the difference between the solubility in 10 per cent and in 18 per cent NaOH are better measures of pulp quality than is the usual alpha-cellulose value (as now determined in Sweden). Karin Wilson, Erik Ringström and Ingvar Hedlund. *Svensk Papperstidn.*, **55**, 31-37 (1952). (In English.)

Testing methods used in exploring wood fiberboards

The author (publishing from the "Wallboard industriens Centrallaboratorium" in Stockholm) has reviewed in some detail the testing of wallboard developed in different parts of the world. This is an initial step in seeking to coordinate, on an international basis, the scattered efforts in this area. This was first undertaken under the auspices of the Food and Agricultural Organization of the United Nations.

The compilation involves an enormous amount of work and shows the importance of arriving at widespread acceptance of common (international) testing methods, quite a number of which have already been accepted. The following testing methods are discussed at length, giving some details for the various countries.

A. Physical properties

(1) Crude weight and caliper. (2) Board moisture; conditioning. (3) Water sorption; swelling, linear expansion. (4) Thermal conductivity. (5) Sound proofness. ((6) Water permeability.

B. Elastic and strength properties

(1) Modulus of elasticity. (2) Tensile strength. (3) Resistance to compression. (4) Breaking resistance. (5) Resistance to bending. (6) Compressibility. (7) Resistance to shock. (8) Hardness.

C. Technological properties

(1) Resistance to the removal of nails. (2) Resistance to hole formation. (3) Resistance to general wear.

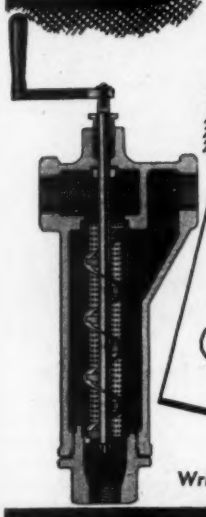
D. Resistance to fire, insects, fungi and chemical treatment.

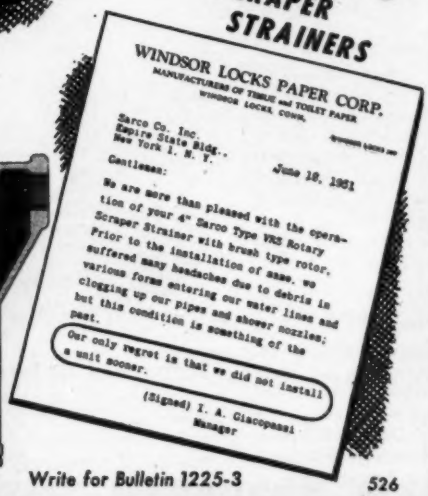
E. Determination of "rapid aging."

The preparation of samples and "normalization" are discussed. The countries represented in this review include the U.S.A., France, Sweden (and Finland), Germany, England, Austria; F.A.O.—"normalizations" are also given. Hans-Heinrich Fickler. *Svensk Papperstidn.*, **55**, 153-172 (1952). (In German).

To keep the debris out of shower water on paper machines

USE SARCO SCRAPER STRAINERS





WINDSOR LOCKS PAPER CORP.
MANUFACTURERS OF TISSUE and TOILET PAPER
WINDSOR LOCKS, CONN.

Sarco Co. Inc.
Empire State Bldg.,
New York 1, N. Y.

June 18, 1951

Gentlemen:

We are more than pleased with the operation of your 4" Sarco Type VRS Rotary Scraper Strainer with brush type rotor. Prior to the installation of same, we suffered many headaches due to debris in various forms entering our water lines and clogging up our pipes and shower nozzles; but this condition is something of the past.

Our only regret is that we did not install a unit sooner.

(Signed) I. A. Giacopassi
Manager

Write for Bulletin 1225-3

526

SARCO SAVES STEAM

SARCO COMPANY, INC.
Empire State Bldg., New York 1, N.Y.
SARCO CANADA, LTD. TORONTO 2, ONTARIO

SULPHITE PULP MILLS

Screen Plates are one of your lowest "cost-per-ton" items, yet they MAKE or BREAK your quality.

Equipped with **Fitchburg NEW TYPE—DUPLEX SLOT** plates, your screens will give maximum production of cleanest pulp.

Especially designed to eliminate "strings," slime and plugging in the slots.

Furnished in "Fitchburg" corrosive-resistant Bronze, plain or chromium plated.

FITCHBURG
Screen Plate Co., Inc.
301 South Street
Fitchburg
Massachusetts

Screen Making
looks mighty simple

Screen Making—is simply a matter of making the right kind of openings of the right shape in the right arrangement in the right metal to fit into the well in the right manner so that the right amount of water can enter the pump bowl area with a minimum amount of resistance while holding back the sand formation. Outside of those details, the job is quite simple.

And the right kind of screen in a well is about as important as is the right kind of motor in an airplane. Fifty years ago, Layne bucked the screen problem and came up with something that hasn't been matched by any other manufacturer.

If Layne builds your water supply units and if sand screen is necessary, your job will have the famous Layne horizontally slotted screen. This means that your well will have a longer life, produce more water and operate on a lower cost than is possible with ordinary conventional screens.

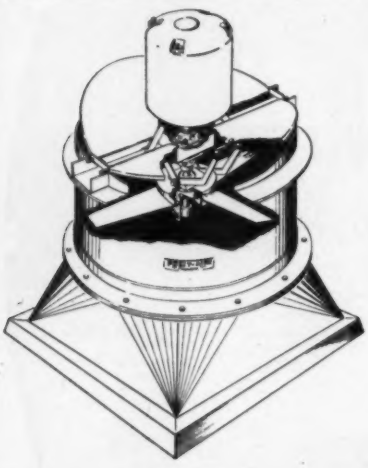
For further information about water wells and complete water supply installations with Layne sand screens, address

LAYNE & BOWLER, INC.
General Offices, Memphis 8, Tenn.

Layne

WATER WELLS
VERTICAL TURBINE PUMPS
WATER TREATMENT

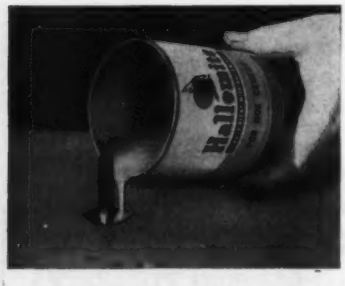
The Paper Industry New Products



Roof ventilator

Because of minimum restriction to impede air flow, the new Posit-Aire roof-type ventilator moves maximum volume of air in a range of 5,000 to 45,000 cfm, depending upon size. Automatic louver design prevents entrance of rain or snow, eliminates drafts or "stack effect" when unit is not operating and prevents back-draft or entrance of outside air. It offers reduction in fire hazard by eliminating draft through roof in event of a fire. Because louvers lock closed, burglar and sabotage protection is afforded. Exhaust air discharges upward to protect roof from damage by fumes or moisture removed from the plant.

Special sizes, top or bottom motor mountings, or belt-driven units for use in corrosive atmospheres can be furnished. Interiors and mechanism can be supplied with protective coatings for moisture and corrosion protection. *Tripar Products, Inc., Dept. 136, 14641 W. Eleven Mile Rd., Royal Oak, Mich.*



Quick setting cement

Anchor bolts for permanently fastening machinery and other equipment to concrete, can now be set easily, quickly and safely with Por-Rok quick setting cement. Por-Rok replaces critical lead and sulphur for most bolt-setting operations. Applied cold, there is no heating hazard, and the cement quickly forms a permanent weld-joint. This cement is self-bonding, self-levelling, oil-resistant, and will not shrink. It has a compression strength of 4500 lb. psi, verified by an independent testing laboratory. It can also be used for quickly repairing concrete floors. *The Hallemite Mfg. Co., 2446 W. 25th St., Cleveland 13, Ohio, Dept. PI.*

Sealed ball bearings

New sealed ball bearings, designed to keep dirt out and lubricant in, are interchangeable with conventional non-sealed bearings. Known as Red Seal bearings, the seal is made of stable DuPont Fairprene and is not affected by petroleum-base lubricants, normal operating temperatures, or ageing.

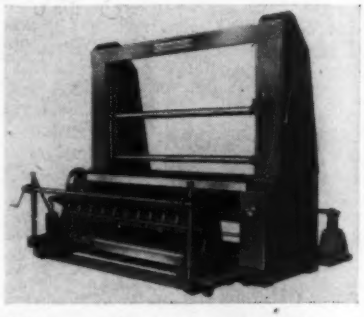
An exclusive design, providing effective sealing, with extremely light contact and low friction, extends the seal below the steel retaining ring, forming a flexible lip which lightly touches a smooth, uniform chamfer of the inner ring.

These ball bearings are supplied in standard single-row SAE widths, and are available with any combination of snap rings and metal shields. *SKF Industries, Inc., Philadelphia 32, Pa.*

Wood-lined fittings

Wood-lined steel fittings and pipe have been fabricated for specialized requirements in paper and pulp manufacture. These specially engineered adaptations were made recently for use in one of the South's largest pulp and paper mills.

The spider-like fitting and other unusual pipe shapes were manufactured to meet specific service requirements for use with wood-lined steel pipe lines carrying brown stock pulp to the storage system. Fittings utilize linings of Douglas Fir encased in an 18-in. seam-welded steel shell protected against corrosion attack. This combination affords excellent resistance to mechanical shock, hydraulic shock and impact while preventing accumulations of slime, fiber bundles and debris within the pipe lines. *Michigan Pipe Co., Bay City Mich.*



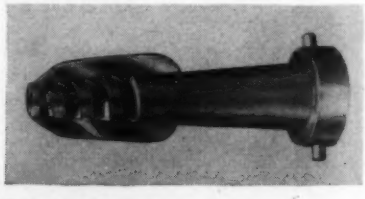
Slitter and surface rewinder

The new No. 25 slitter and surface rewinder for 32 to 92 in. length and up to 42 in. diameter rolls has a 2,000 fpm speed capacity. It is equipped with power-driven riding roll lift and air-operated slitting units for strips as narrow as ½ in. The entire mechanism is fully enclosed to insure cleanliness. The machine is mounted on heavy bedplate to eliminate vibration. *Bagley & Sewall Co., Watertown, N.Y.*

Bin-level control switches

In addition to the normal-duty "Tellevel" automatic bin-level control switches, heavy-duty and explosion-proof units are now being manufactured to meet special installation conditions. All switches are designed so that a rising, or falling, level of material in bins deflects a pendant float actuating a micro switch.

The explosion-proof switch is designed for operation in hazardous areas where explosive vapors and dust occur, while the heavy-duty unit is recommended when lump sizes above ¾ in. are being discharged to bins. The switches are shipped ready for installation, with color coded pig tail connections for easy wiring, and require no maintenance. Units can be hung from pipe conduit for which all housings are tapped, or bolted to bin walls or plates by means of attached mounting brackets. *Stephens-Adamson Mfg. Co., Aurora, Ill.*

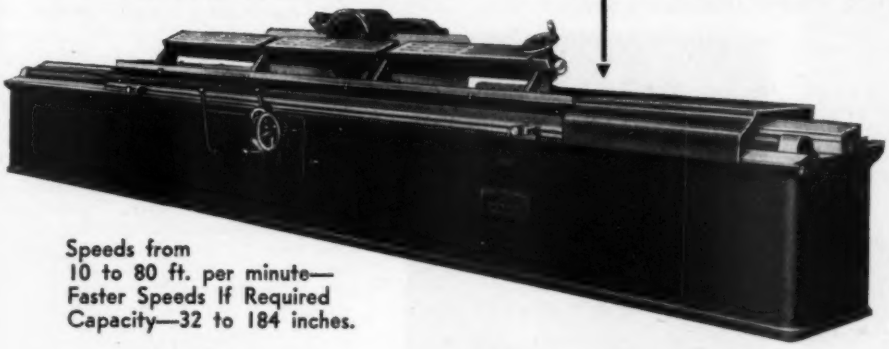


Fog nozzle

A new giant-size fog nozzle, Giant Model 500, made especially to combat large fires in or out-of-doors, has recently been announced. The new nozzle delivers a 500 gal.-per-minute fog blanket with a large

HANCHETT KNIFE GRINDERS
For the PULP and PAPER INDUSTRY

For GRINDING Chipper-Hog-Trimmer-Barker Knives, DOCTOR BLADES and BED PLATES



Speeds from
10 to 80 ft. per minute—
Faster Speeds If Required
Capacity—32 to 184 inches.

GK

Available with either
Segmental or Cylinder
Type Wheels.

• **Table Driven** • **Hydraulic** • **Electrical** • **Full Automatic**

Proved and improved through years of extensive research, Hanchett grinders give precision tolerances and finest finishes under heaviest grinding schedules.

Tell us your knife problems. Our engineers may have a money-saving solution for you.
Write Dept. PI-62

HANCHETT GRINDERS — BIG RAPIDS MICHIGAN

HANCHETT MANUFACTURING COMPANY

World's Largest Manufacturer of Saw Sharpening and Knife Grinding Machinery

Main Office—BIG RAPIDS, MICH. • West Coast—PORTLAND, ORE.

What's corn doing up in the rafters?

Basic research in corn helped put it up there . . . in the form of fibre glass insulation.

Certain types of dextrins are needed to produce the glass fibre. These particular dextrins are developed by research in corn. Corn fills a myriad of industrial needs . . . our continuing basic research in corn serves all American industry . . . serves you.

Corn products in paper manufacture

Starches and adhesives . . . superior formula ingredients for such processes as beating, corrugating and laminating . . . and new techniques for using various corn products are being developed and refined by Corn Products Refining Company.

If you have a production problem why not check with Corn Products? A complete line of corn products for every purpose is available. Technical service is yours . . . no obligation, of course.

CORN PRODUCTS REFINING COMPANY
17 Battery Place, New York 4, N. Y.

Manufacturers of

GLOBE®	AMIJEL®	CORAGUM®	LAM-O-DEX®
brand starch	brand starch	brand starch	brand gums

diameter of coverage and an effective reach of approximately 80 ft.

Made with 2½-in. National Standard Thread connection, the nozzle can be attached directly to a hose or turret gun having this thread, in place of the conventional straight stream nozzle.

A unique feature of the nozzle is its patented spiral atomizing element which contains no small orifices or internal parts. Small stones, bits of hose, washers, or other foreign matter pass freely through the nozzle without clogging. Made entirely of bronze, the nozzle has external vanes for added strength in rough service. *Bete Fog Nozzle Inc., 85 Pierce St., Greenfield, Mass.*

Solenoid control unit

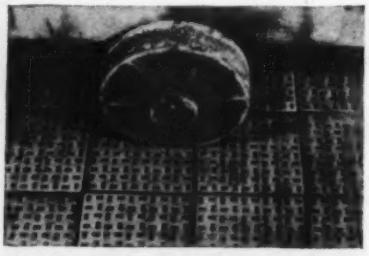
A new electro-mechanical device, employing dual oil damped solenoid units that are adaptable for applications requiring extremely quiet cushioned motion with moderate power requirements, has recently been developed.

Two models have been introduced: an open unit and a totally enclosed oil-filled unit. The latter is completely sealed and utilizes neoprene oil seal gaskets for the cam shaft and may be mounted in any position. The open unit is furnished with open wells and must be mounted horizontally. Both models are furnished with 24-volt solenoids, wound for either intermittent or continuous duty.

Special solenoid assemblies to specified design and power requirements can be furnished. *Scully Machine Co., 62 Walter St., Bridgeport 8, Conn.*

Tractor

A new tractor model has been added to the Truck-Man line of industrial trucks. Designated as "Truc-Tor" Model DR, it is capable of hauling cargo trains of up to 13 times its own weight (990 lb.) on dry, level concrete. The heavy-duty air-cooled engine of 5.8 hp is said to operate a full eight-hour shift on approximately one gallon of gasoline. It is equipped with heavy-duty industrial pneumatic tires all around. *The Knickerbocker Co., Truck-Man Div., 635 Liberty St., Jackson, Mich.*



Floor surface reinforcement

Floor Plate, an 11¾-in. square plate of .068-in. hot-rolled steel, designed for the reinforcement and protection of concrete floor surfaces that are constantly subjected to heavy industrial loads and severe punishment, is now available. It can be installed as a new floor surface or over old floors. No special tools are necessary for installation. The plates are pressed into the concrete topping until pillows of concrete extrude upward through the holes; the plates are then leveled off.

Each plate contains 100 small rectangular holes approximately ½ x ¾ in. and 100 barbed prongs ¾ in. long. These prongs anchor the plate firmly to the concrete. The four rounded edges of each plate form a flange that becomes imbedded in the concrete and adds rigidity to the plate.

Area-wise, the surface of a concrete floor reinforced with this plate is 74 per cent steel and 26 per cent concrete. *Acme Steel Co., 2840 Archer Ave., Chicago 8, Ill.*

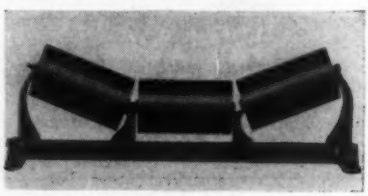
Turbine vane-type pumps

A complete line of self-priming and standard design turbine vane-type pumps for pumping hot and cold, clear and vaporous liquid, in moderate capacities, against medium or high heads, has been introduced to the market.

The free running impeller is the only moving pump part in this pump. Because side and top suction are employed in the case design, disassembly of the liquid end for inspection and repair is simple and may be accomplished without breaking suction or discharge piping.

The self-priming device consists of a trap on the suction and an air separating chamber on the discharge. These insure liquid in the pump case at all times, which is necessary for self-priming. The suction trap includes a strainer for further protection to the pump.

Type TVE is the designation given to the line of pumps close-coupled to face mount electric motors, while the line of flexible-coupled electric drive pumps is designated as Type TVB. Pumps in both lines are available with or without the self-priming device. *Peerless Pump Div., Food Machinery & Chemical Corp., 301 West Ave. 26, Los Angeles 31, Calif.*

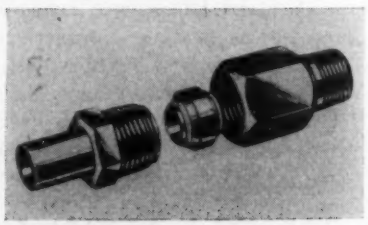


Belt conveyor idler

An improvement has been made in the greasing design of belt conveyor idlers. Rigid steel grease piping has been replaced by reinforced flexible automotive-type grease tubing, which will take higher gun pressures and will not be broken off in shipment.

The flexible sections are made in lengths which allow them to "hug" the inside of the inverted angle or channel base. Grease tube extension to the far side is accomplished by threading a flexible section through the base to the grease fitting at the near side.

The location of the grease fittings has also been changed. They are placed so as to be more accessible, permitting safe servicing at any time, and are protected during shipment by the idler base. *Chain Belt Co., 1600 W. Bruce St., Milwaukee 4, Wis.*



Tube fittings

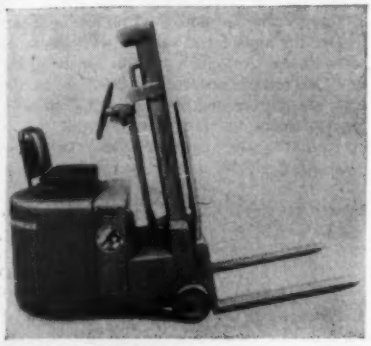
A new line of corrosion resistant stainless steel fittings, for Schedule 5 S and 10 S tubing, has been announced. Included is a standard selection of elbows, tees, unions and connectors for tubing sizes up to ¾ in.,

MISCO
STAINLESS STEEL CASTINGS
FOR ALL EQUIPMENT EXPOSED TO CORROSION BY SULPHITE ACIDS OR OTHER CORROSIVE AGENTS
MICHIGAN STEEL CASTING CO.
DETROIT 7, MICHIGAN

MILL COGS
We make a specialty of "Ready Dressed" cogs which are READY TO RUN the moment driven and keyed. Write for circular "O" and instruction sheets free.
The N. P. BOWSHER Co., South Bend, Ind.

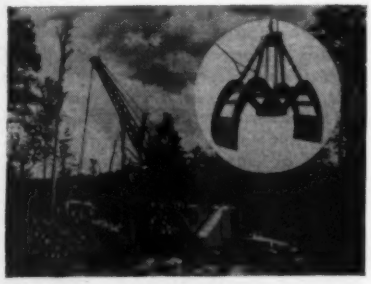
with couplings for larger diameters handled on special order.

This new line incorporates the patented, self-centering seat, providing a leakproof, wedge-type seal, even though the tube is assembled off center. Another feature is the reinforcing Teflon rings that double-seal the seat to further guard against gas or liquid losses. *The Special Screw Products Co., 5445 Dunham Rd., Bedford, Ohio.*



Electric fork truck

The new Spacemaster "J" Model electric fork truck makes electric fork truck installations possible where there is a limited amount of space. It is manufactured with heavy-duty components, providing long periods of full-power service but slightly less travel and lifting speed. This rugged, lightweight fork truck is low in price. *Lewis-Shepard Products Inc., Watertown, Mass.*



Grapple

A new all steel welded grapple, designed to facilitate loading of pulpwood and similar materials with the 5-ton capacity truck-mounted Bantam crane, is now available.

Rated at ¼-cord capacity (100 in. wood), the new grapple has a tong opening of 5 ft. 3 in., with a gross weight of 1155 lb. Over-all length of the tong blade is 2 ft. 8 in., while over-all grapple height is 5 ft. 2 in.

Constructed of cold rolled steel shafting and angle irons, with easily lubricated zerk fittings and bronze bushings in sheaves, the unit is said to combine light weight and good balance with rugged strength and fast, easy operation. *Schield Bantam Co., Waverly, Iowa.*

Slurry flow control valve

Designed particularly for proportioning and controlling pulp and paper stock and similar slurries, the new Ratogate valve can be used for any low pressure automatic service.

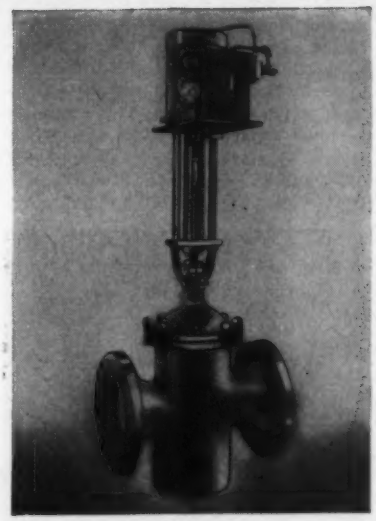
This valve has a range of operation of 13 to 1 or better because it will throttle automatically and remain free from plugging even at flow rates as low as 30 gpm. It is entirely self-cleaning. A sight-glass window permits inspection of the discharge port and the sliding gate. This gate has no top and bottom or side guiding surfaces to create excessive friction and offers no place for stock to ball up and wedge.

All Ratogate valves are equipped with pneumatic cylinder operators and positioners which assure forces considerably in excess of those normally required to operate the valves. In the smaller valve sizes the positioner is an integral part of the operator. It is externally mounted on the larger sizes. Tapped openings are provided at the inlet fitting and on the valve body so that a water purge line to flush the inner valve in shut-down can be added if desired. *Fischer & Porter Co., 6110 County Line Rd., Hatboro, Pa.*

Variable speed drive

A variable speed drive with mounting dimensions that are interchangeable with NEMA standard motors has recently been announced.

This new drive consists of a variable-speed transmission with positively adjusted pulleys and an induction motor built in a single, compact unit. It is designed to save machinery manufacturers the cost of building special bases where interchangeability between variable speed drives and NEMA stndard motors is required. *Sterling Electric Motors, Inc., 5401 Anaheim-Telegraph Rd., Los Angeles 22, Calif.*



Throttling control valves

Conoflow pneumatic cylinder operators and Paul venturi-ball valves have been combined in the development of a complete line of throttling control valves. With the combination of these units, it is possible to greatly simplify many difficult control problems, involving corrosive fluids, abrasive materials, high temperature and high pressure applications and other difficult services. *Conoflow Corp., 2100 Arch St., Philadelphia, Pa.*

Tractor

The "stand-up" drive load-mobile tractor is specially designed and manufactured to cut down material handling costs where items are stored on either skids or pallets —one skid or pallet for each item. Designed with a low platform seven inches off the

One of the Men Behind Eastwood Wires

Patrick Edward Daley

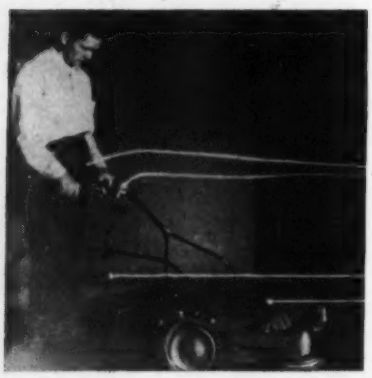
"Ambassador" to NEW JERSEY — PENNSYLVANIA — DELAWARE
MARYLAND — VIRGINIA — OHIO

You know him better as "Pat" Daley, one of our able field men. Though his territory is defined, there are no limits on his wide friendship, his unfailing good nature or his knowledge of the paper field—the last acquired through service in mills that belong in the paper industry's "Who's Who", including production of ground wood specialties, kraft and bag papers, newsprint and other specialties. His long experience in supervisory capacities in both large and small mills has helped us to serve the paper industry better since he joined us in 1935. We are happy to acknowledge his valuable services.

EASTWOOD-NEALLEY CORPORATION • Belleville, N. J.

floor, it eliminates unnecessary exertion in getting on and off or unloading.

Operation is made easier by the use of the same pedal for both forward and reverse operations. Reversing is controlled by a separate selector switch. It hauls up to 10,000 lb. at approximately 3 mph. Unloaded, it travels approximately 4½ mph. *Market Forge Co., Everett 49, Mass.*



Sweeper

Plantman, a sweeper which is now being marketed, has proved especially economical where passageways are at least 30 in. wide and where a minimum of 7,500 sq. ft. of floor space or outside area exists to be cleaned.

Time and motion studies have demonstrated that this sweeper will sweep and collect in an hour five to seven times the area that can be swept by conventional hand methods. Plantman's hopper collects everything from paper to coke bottles and never becomes too heavy for one man to lift. It is claimed that this sweeper saves in one operation 87 per cent of the time exhausted by using other methods.

Models with either a 20-in. or 28-in. sweeping width are available. A side wall brush which adds 6 in. to either model and sweeps right up to the bottom of walls, machinery, and stockpiles is optional. *Handling Devices Co., Inc., 581 Boylston St., Boston 8, Mass.*

pH meter

A new Philips Universal pH meter, precision built for quick, accurate measurements of hydrogen-ion concentrations, is now available. The new instrument is designed for all pH and rH work, for potentiometric titrations and for oxidation-reduction-potential investigations.

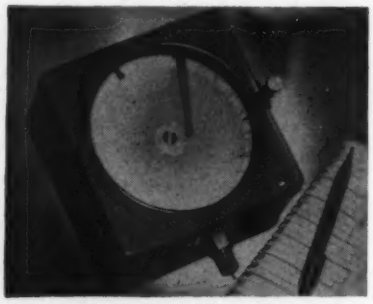
For laboratory research and industrial testing purposes, it provides a measuring accuracy of 0.01 pH or 0.5 mv., a range of 0-14.15 pH and 0-1415 mv, absolutely currentless measuring with no phenomena of polarization, and zero indication by cathode ray tube. It can be used with glass, quinhydrone, hydrogen and platina electrodes and is direct calibrated for the first three.

The pH meter is supplied with the new, removable Philips calomel and glass electrode and is provided with controls which correct for temperature variations and for asymmetric potentials. An auxiliary chemical assembly is available as an accessory. *Research & Control Div., North American Philips Co., Inc., 750 S. Fulton Ave., Mount Vernon, N. Y.*

Powered hand truck

A new extra-heavy-duty low-lift platform Worksaver, a powered hand truck for the horizontal transportation of skids and skid bins, is now available.

This new 7500-lb. model has the highest capacity of any truck in the Worksaver line, yet keeps within the over-all dimensions of the lower capacity models. It has an 11-in.-high platform, with 3 in. of lift. For operaions on ramps, it has 5 in. of underclearance. The platform is 26½ in. wide. Standard platform length is 42 in., but other lengths are available. *Yale & Towne Mfg. Co., Philadelphia Div., Philadelphia 15, Pa.*



Miniature recorder

The development of an exceptionally compact instrument for measuring and recording very low pressures has recently been announced. Known as the Type 3-B Minicorder, this instrument is designed for chart records as low as 0 to 10 in. head of water pressure, with other chart ranges available to as high as 0 to 60 psig. Over-all dimensions are 5¼ x 5¼ x 2¼ in. deep, and weight is 2 lb. (The case of one model is 3½ in. deep.)

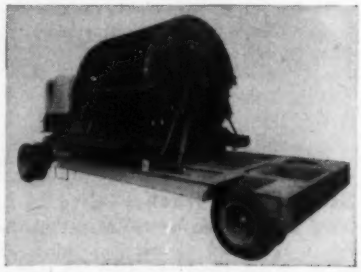
This recorder is equipped with a ¼-in. male bottom connection and easily replaces most dial gauges. The measuring elements of the Type 3-B consist of a series of brass bellows. For certain ranges, stainless steel bellows may be specified. The bellows provide ample power to move the pen across the chart without lag or drag. This minicorder can be calibrated in many different units and combinations. *The Dickson Co., 7420 Woodlawn Ave., Chicago 19, Ill.*

Flow meters

A new line of Bristol Series 500 open channel flow meters for measuring, recording, and controlling the flow of water, sewage, industrial plant effluent, irrigation water, and other liquids has been announced. The new meters supercede the Model 40M line.

Two general types are offered. In the mechanical type, the cam mechanically moves the pen arm across the chart. The electric type employs the Bristol timed-impulse type of remote recording. With this type, the record can be made at any distance from the point of measurement. The impulses are transmitted by a pair of conductors or equivalent circuit.

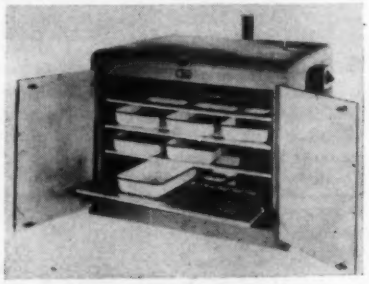
Cams can be cut to provide uniform charts for any of the various weir plates in general use. Automatic control can be either air—or electric-operated, according to the user's requirements. *Bristol Co., Waterbury 20, Conn.*



Barking drum

The Murco-Adams-Clark portable barker, a barking drum that can be taken to the wood lot, itself, has recently been patented. It will debark all types of wood and discharge barked wood by gravity to conveyor or ground, with little damage to the wood, no "brooming," and virtually no wood loss from debarking action. This barker is easily adapted to logging conditions, simple to operate, and has low maintenance and relatively low horsepower requirements.

The barker is available in eight sizes to handle various wood lengths from 48 in. to 110 in., and is furnished either truck, tractor or skid-mounted. *D. J. Murray Mfg. Co., Wausau, Wis.*



Laboratory dryer

A new laboratory dryer, incorporating the latest features of design and precise control of temperature and circulation, is now on the market. This compact, inexpensive dryer operates on a single phase, 50-60 cycle, 110 or 220 volts A.C. It has an asbestos air-cell insulated oven using a pair of standard, easily replaced heating elements. The dryer is portable and any number of them may be stacked or banked for multiple operation, but separate controls permit use of only those that are actually required at any one time. *Denver Equipment Co., 1400 17th St., Denver, Colo.*

New Products Briefs . . .

HEAT EXCHANGER—A newly designed heat exchanger, which consists principally of a compact cube of "Delanium" carbon, a new elemental carbon product, is much smaller than a conventional heat exchanger of comparable performance and can be installed singly or in banks. It is particularly useful with corrosive liquids and all except the most highly oxidizing acids. *British American Carbon Corp., 18 E. 48th St., New York 17, N. Y.*

METAL PRIMER—Heavy-duty, rust-inhibitive Prufcoat Primer P-50 can be used with either conventional paint or active-solvent protective coatings. Ideal surface conditions, which are seldom found outside of the laboratory, are not necessary. It requires only overnight drying prior to the application of active-solvent finish coats. *Prufcoat Laboratories, Inc., 50 E. 42nd St., New York 17, N. Y.*

WORK CLOTHES—ChemKlos, work clothes made of the new Dynel fabric, are said to resist acids, caustics, wear, moths, mildew, shrinkage, snagging, and tearing. Available in shirts, trousers, and coveralls, these work clothes are not harmed by commercial dry cleaning and washing solvents in concentrations hard on ordinary fabrics. *Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa.*

RUST PREVENTIVE PAINT—Outstanding features of this new paint, "Rust Inhibitor No. FD-425," are that it will dry in 10 minutes under normal drying conditions, and one coat will cover the old metal surface. Also, it will withstand temperatures from —100 F. to 250 F. and is exceptionally resistant to salt air and fumes. *United Laboratories, Inc., Cleveland 12, Ohio.*

CAPNUT—Known as the Security Caploc, this device provides the positive locking of the Security Locknut wherever acorn or capnuts must be used. It affords a protection against moisture and corrosive action that destroy bolt ends and make a nut nonremovable. This capnut also provides protection for the bolt itself where mutilation and abrasion are possible. *Security Locknut Corp., Melrose Park, Ill.*

DUST RESPIRATOR—Designed to provide the highest degree of user comfort ever attained in a respirator, 10 recently engineered advances are incorporated in the Dustfoe No. 55. It weighs only 2¾ oz., 25 per cent less than previous models. Breathing resistance has been cut in half. *Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa.*

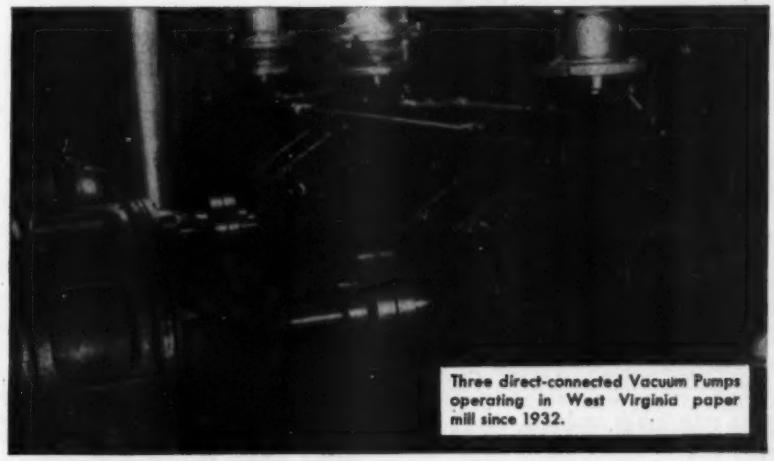
SAMPLE CUTTER—The JDC precision sample cutter cuts test strips with clean, sharp edges of the exact width parallel throughout the entire length, free from nicks and uncut or pulled fibres. It cuts stock sizes 15mm x 250 mm; 1 in. x 10 in.; and ½ in. x 10 in. Others are made to order. *Thwing-Albert Instrument Co., Penn St. & Pulaski Ave., Philadelphia 44, Pa.*

RUST INHIBITIVE PRIMER—A combination rust inhibitive primer and finish coat which normally dries from within 10 to 15 minutes is another major development in the rust inhibitive field. Used for either interior or exterior finish, adhesion is excellent. *The Wilbur & Williams Co., 130 Lincoln St., Brighton 35, Mass.*

CONCRETE PAINT—Smooth-On No. 15 concrete paint can be used on interior or exterior concrete, cement block, brick and stone. It does not require any primers or sealers and can be applied to painted or unpainted, dry or damp surfaces. It has a high resistance to water, acid or alkaline attack. *Smooth-On Mfg. Co., Jersey City, N.J.*

CHOKER SLING FITTING—This newly designed sling fitting employs two overlapping and coacting hooks which are easily applied to a wire rope to form a loop of any desired size. The rope cannot be freed from the sling until both hooks are disengaged manually. The hooks are joined to the fitting portion of the choker sling fitting by a pivot which allows the unit to conform automatically to the size of the load. *Electroline Co., 4121 S. La Salle St., Chicago 9, Ill.*

INSTRUMENT PANEL—Clark gas-powered Carloader and Clipper model fork trucks are now equipped with a newly-designed instrument panel included as standard equipment. The panel includes fuel, temperature and oil-pressure gauges, ammeter, ignition switch, horn and Mico brake control fuses and starter button. *Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.*



Three direct-connected Vacuum Pumps operating in West Virginia paper mill since 1932.

COMPARE THESE 5 VALUES WHEN YOU BUY VACUUM PUMPS

Outstanding satisfaction with Roots-Connersville Vacuum Pumps for paper mill operation has been gained by their high ratings in these five essentials to adequate performance. Our engineers will gladly work with you in selecting equipment for your specific needs. Send for Bulletin 50-B-13, which deals exclusively with R-C Cycloidal Vacuum Pumps for Paper Mill Operation.

1. **LOW POWER CONSUMPTION**—because units are recommended, either single or compound, to operate at the most efficient point.
2. **NEGLIGIBLE FRICTION LOSSES**—no contact between impellers or impellers and casings.
3. **HIGHER SPEEDS**—permitting direct connection to standard motors, saving first cost, space and weight.
4. **FLEXIBILITY**—to meet varying demands; suction automatically overcomes resistance in system.
5. **DEPENDABILITY**—long-time, attention-free operation, due to simplified design and construction.

Roots-Connersville Blower Div., 521 Monroe Ave., Connersville, Indiana

ROOTS-CONNERSVILLE BLOWER

A DIVISION OF DRESSER INDUSTRIES, INC.

The Paper Industry New Literature

Books

FOREST MANAGEMENT. H. Arthur Meyer, Arthur B. Recknagel, and Donald D. Stevenson. Published by The Ronald Press Co., 15 E. 26th St., New York 10, N. Y. 290 pages. 6 x 9. $6.00.

In this comprehensive volume the authors have brought together the basic material on forest management, from the standpoint of its applicability to American forests. It is designed both as a text for forestry students and as a manual to guide foresters in applying management practices to the forests under their care. It covers the general problems of forest organization and the principles and methods of forest regulation, both of which are essential to the preparation of workable management plans. Typical examples of such plans for forests of various sizes, located in various parts of the country, have been included in only slightly abbreviated form.

THE CHEMISTRY OF LIGNIN. By Friedrich Emil Brauns. Published by Academic Press Inc., 125 East 23rd St., New York 10, N.Y. 808 pages. $14.50.

The first book to include the work of the past 25 years on this important raw material, and the first to be published in English, it represents an attempt to bring some order into the chaos of contradictory claims made in the literature of chemistry, facilitating future and more orderly fundamental research.

Some of the topics included in this volume are: the evolution of lignin chemistry; definition and distribution of lignin; color reactions of lignified materials; isolation of lignin; determination of lignin; physical properties; elementary composition and constituent groups; many chemical processes involving lignin; special reactions with lignin; thermal and biological decomposition; theories on its formation and structure; the linkage of lignin in the plant; and synthetic lignins.

COMMUNICATION OF TECHNICAL INFORMATION. By Robert M. Dederich. Published by Chemonomics, Inc., 400 Madison Ave., New York 17, N. Y. 116 pages. 6 x 8¼. Paperbound. $5.00.

Reporting is the subject of this book; however, it is not an outline for proper report writing. It does not concern itself with grammar, spelling, and punctuation. The author views the art of communication as the nerve system of an organization, with the technical man as an integral part, working not only at his specialty, but transmitting his ideas and results to other people.

Written from the point of view of the business manager, methods of communication are evaluated with the following fundamentals in mind: Why is the transfer of information necessary? Who can use the information? How will the information be used?

The stress is on the thinking and logic which underlies the communication of technical information. The treatment of this subject in this book covers inter-organization memos, progress statements, and oral presentation in conference, in addition to the written report.

THE ENGINEER'S ILLUSTRATED THESAURUS. By Herbert Herkimer. Published by The Chemical Publishing Co., Inc., 212 Fifth Ave., New York 10, N.Y. 572 pages. $6.00.

Over 8,000 illustrations of machine elements and assembled machinery are included in this volume. Where necessary, an explanation of the method by which the machine element accomplishes its particular function is given.

The main classes treated in the book are: fasteners; adjusting devices; supports and structures; basic mechanical movements; elevators, cranes, derricks, conveyors; transmission of liquids and gases; combustion; prime movers; transportation; industrial processes; electrical appliances; comfort heating, cooling and air conditioning.

Booklets and Pamphlets

PAPER AND PAPERBOARD—Characteristics, Nomenclature, and Significance of Tests. (Special Technical Publication No. 60-A). Published by American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. 140 pages. 6 x 9. $2.50. This revised and expanded edition of the 1944 Monograph on Paper and Paperboard provides expert and critical discussion of the significance of the more commonly used tests and defines terms, nomenclature, and properties of paper related to these tests.

PROGRESS IN PEROXIDES. (Bulletin No. 36). By H. O. Kauffmann and F. P. Greenspan. Published by Buffalo Electro-Chemical Co., Inc., Research and Development Dept., Station B, Buffalo 7, N.Y. 26 pages. 8¾ x 11¼. Based on a paper presented at the American Institute of Chemists Annual Meeting, May 1951, this new bulletin gives a composite picture of properties and applications of two important peroxygen chemicals, hydrogen peroxide and peracetic acid, with the aid of many practical examples, tables and diagrams.

RESIN BONDING OF OFFSET PAPERS CONTAINING MINERAL FILLERS. By Martin J. O'Leary, Bourdon W. Scribner, and Joshua K. Missimer. Published by National Bureau of Standards, U.S. Department of Commerce, Washington 25, D.C. 6 pages. 10 cents. This pamphlet presents the results of an investigation of the influence of mineral fillers on the beneficial effects of the binding resin and the effect of the resin on the retention of the fillers in the paper. (Order from Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.)

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.

Heavy-Duty Paints. American-Marietta Co., 43 E. Ohio St., Chicago 11, Ill.—This 12-page booklet deals with types of heavy-duty Valdura paints used in the paper industry and is No. 9 in the Industrial Maintenance Series. Charts are given, six of which list the type of paint to use on the various surfaces in papermaking processes. One chart gives the paints used on parts in the woods and yards division; another lists the recommended paints, their characteristics, and per cent of reduction recommended.

Flow Meters. The Bristol Co., Waterbury 20, Conn.—A new 40-page bulletin, No. F1605, describes Bristol's "Series 500" line of flow meters. Both mechanical and electric-type flow meters are described in a full range of models. In addition to numerous photographs, the bulletin is liberally illustrated with reproductions of actual recording charts, and sketches of typical methods of applying the instruments.

X-ray Diffraction and Spectrometry. North American Philips Co., Inc., Research & Control Instruments Div., 750 S. Fulton Ave., Mount Vernon, N. Y.—"X-ray Diffraction and Geiger-Counter X-ray Spectrometric Equipment" is the title of a new 60-page catalogue which covers such components and accessories as tubes, rectifiers and cameras, etc., in addition to X-ray diffraction, spectrometry and fluorescence analysis. Information is also provided on application for X-ray instruments, along with typical charts which show how specimens differ when analyzed.

Hydraulic Elevating Tables. The Raymond Corp., 8088 Madison St., Greene, N. Y.—This new bulletin (No. 206), consisting of 4 pages, describes Raymond's complete line of hydraulic elevating tables. Models are shown which can be used for die handling or work positioning and for strip and sheet feeding operations.

Fans. Buffalo Forge Co., Buffalo 5, N. Y.—This 24-page pocket-size booklet is devoted to fan maintenance and installation data. The first part gives erection and maintenance hints, including sections on lubrication, fan balancing, repair parts, safety precautions, etc. The second part, which gives hints for air conditioning equipment, includes sections on lubrication and drives, balancing, air washers and humidifiers, evaporative condensers and "PCLW" cabinets, "PC" and "VPC" cabinets, etc.

Flat Leather Belting. J. E. Rhoads & Sons, 35 N. Sixth St., Philadelphia 6, Pa.—Rhoads Tannate flat leather belting is illustrated and described in a new, three-color folder.

Synchronous Motors. Electric Machinery Mfg. Co., Minneapolis 13, Minn.—"Application of Direct-Connected Synchronous Motors to

MAGNUS-MADE

FABRICATED SCREEN PLATES

for High Plate Capacity — Long Plate Life

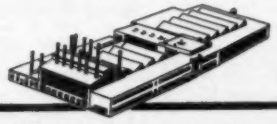
"Hardy" fabricated screen plates, made by Magnus of chrome-nickel-steel or inconel, have a high-strength, thin sheet design that's specially engineered for *maximum flow*. About 40,000 of these plates are now in service, with performance records that prove these three important advantages:

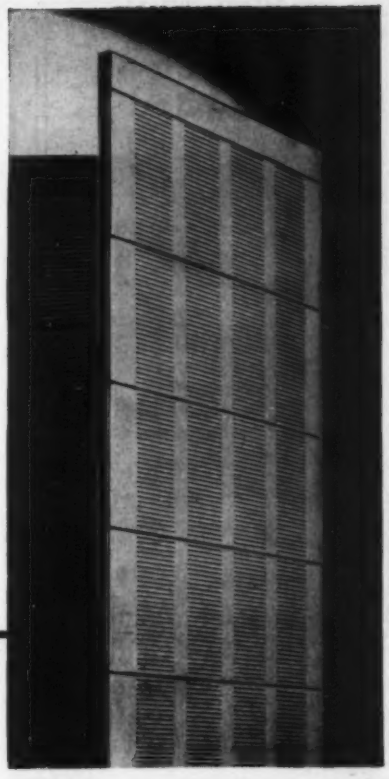
1. Increased Plate Capacity. The thin sheet eliminates relief milling, and with recommended arrangement, substantially increases capacity per plate.

2. Longer Life. Slots remain sharp, side walls highly polished for the life of the plate. There's greatly improved corrosion resistance, too.

3. High, Sustained Yield. Fabricated screen plates assure consistent, uniform quantities of cleaner pulp. This means improved production at reduced operating costs.

Complete information is yours on request. Or if you like, we'll gladly have an engineer call.





MAGNUS METAL CORPORATION, *Fitchburg, Massachusetts*

Metalworkers for the Paper Trade

SCREEN PLATES: BRONZE, CHROME-NICKEL-STEEL, AND INCONEL
VALVES: GATE, SWING CHECK, BLOW, GLOBE, ANGLE AND "Y"

The Trade-Mark of

Dependable Felts

The Waterbury Felt Company

SKANEATELES FALLS, N. Y.

SULPHITE MILL ACID PLANTS

Sulphur Burning Plants • Jenssen Two Tower Acid Systems • Gas Coolers—Surface and Spray Type • Jenssen Pressure Acid Systems • Jenssen Auxiliary Process Towers • Recovery Plants—Cooking Acid

SOLUBLE BASE ACID PLANTS
SEMI CHEMICAL PLANTS
JENSSEN SO_2 ABSORPTION SYSTEMS

FOR BLEACH PLANT APPLICATION
SULPHUROUS ACID PREPARATION

G. D. JENSSEN CO., INC.
WATERTOWN, NEW YORK
WESTERN REPRESENTATIVE:
JAMES BRINKLEY COMPANY, Seattle, Washington
FOUNDED 1915

ENGLISH ECCO CLAYS CLAYS

ECCO CLAYS TRADE MARK

UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation
551 Fifth Avenue, New York City

The Paper Industry
Professional and Business Services

ARTHUR C. DRESHFIELD, Ch.E.
CONSULTANT
Research . . . Development . . . Control
Market Research
Laboratory Investigations thru affiliation with
Chicago Testing Laboratory
536 Lake Shore Drive, Chicago 11, Illinois

Engineers
Industrial Plants • Textile & Paper Mills • Location Studies • Appraisals • Reports • Surveys
J. E. SIRRINE COMPANY
GREENVILLE
SOUTH CAROLINA

Reciprocating Compressors" is the title of this 12-page technical article (No. 1200-TEC-1111), which deals largely with consideration of proper rotor flywheel effect (WK^2) as a preventive measure for voltage fluctuations when driving reciprocating compressors with direct-connected synchronous motors. Examples, complete with formulas, sample calculations, and reference curves, are included.

Hand Lift Trucks. Barrett-Cravens Co., 4609 S. Western Blvd., Chicago 9, Ill.—This illustrated bulletin (No. 5110) gives comprehensive information on the current models of Barrett single stroke hand lift trucks. Complete specifications are included for models shown.

Thermocouple Glands. Conax Corp., 4515 Main St., Buffalo 21, N. Y.—This 4-page illustrated Bulletin 951 fully describes bare wire thermocouple glands. A useful table is given on thermocouple wire, providing gage number, diameter, circular mils and area and weight of wire per unit length.

Corrosion-Resistant Fittings. Horace T. Potts Co., Erie Ave. and D St., Philadelphia 34, Pa.—Speedline corrosion-resistant fittings are the subject of this 20-page catalogue. The catalogue illustrates types and sizes and describes exclusive features of the fittings now available in several stainless analyses.

Electronic-Optical System. Fisher Scientific Co., 717 Forbes St., Pittsburgh 19, Pa.—This 16-page booklet, "The Nefluoro-Photometer," explains the theory behind three important methods of analysis: colorimetry, fluorometry and nephelometry. It also describes the operation of a new precision instrument combining all three of these techniques in one simple electronic-optical system.

Belt Conveyor. The Rapids-Standard Co., Inc., Grand Rapids 2, Mich.—This 4-page bulletin (TV-52) with photos, application sketches, and complete specifications of the new Rapistan Table-Veyor horizontal belt conveyor also illustrates and explains the many uses of the Table-Veyor.

Round Container Labeling. Paisley Products, Inc., 1770 Canalport Ave., Chicago 16, Ill.—This new and revised 8-page illustrated technical service bulletin, No. 16, contains sections on food container labeling, chemical product container labeling, government specification container labeling, and a description of labeling methods, spot labeling and wrap-around labeling. Illustrated are all the current machines used for automatic or semi-automatic operation of labeling lines.

Worm Gearing. The Cleveland Worm & Gear Co., 3293 East 80th St., Cleveland 4, Ohio—This 180-page catalogue, No. 400, illustrates and describes each model in the complete line of Cleveland worm gear speed reducers, as well as worm and gear sets for built-in power transmission applications. It contains engineering and application data on each unit, including dimensions, weights and rating tables.

Maintenance Coatings. United Laboratories, Inc., 16801 Euclid Ave., Cleveland 12, Ohio—This new 4-page bulletin describes a dozen different special coatings for plant maintenance. Numerous problems, such as skidproofing, rust prevention, painting over damp areas, painting over hot surfaces, protection against acids, chemical fumes, interior waterproofing, weatherproofing and decoration of exterior masonry and other special maintenance work are listed in the folder, followed by brief suggestions as to the solution.

Roof Maintenance. Tropical Paint & Oil Co., Cleveland 2, Ohio—This new booklet entitled "Saving Old Roofs" illustrates how periodic maintenance can prolong roof life. It details each step in preparation of the roof and application of Tropical roof maintenance products. Every type of industrial and commercial roof is covered.

Induction Motors. Allis-Chalmers Mfg. Co., 991 S. 70th St., Milwaukee, Wis.—Construction features and types of large vertical induction motors widely used for pumps and other vertical drives are described in the new 4-page bulletin, "Large Vertical Induction Motors," (05B7629).

Control Mechanism. Hagan Corp., P. O. Box 1346, Pittsburgh 30, Pa.—The improved design of the Hagan Ratio Totalizer is described and pictured in the 8-page Bulletin 5452. Included is a description of its construction, operation, and applications, together with diagrams.

Centrifugal Sump Pumps. Warren Steam Pump Co., Inc., Warren, Mass.—Improved models of types VS and VN sump pumps are illustrated and described in this 8-page bulletin, WQ-220. Included are photographs, diagrams, and tables.

Concrete Floors. Flash-Stone Co., 3723 Pulaski Ave., Philadelphia 40, Pa.—This illustrated 20-page bulletin entitled "Traffic Concrete—A Study in Specialization" explains the advantages of Dynapakt concrete floors in terms of materials used and especially developed methods of installation. A step-by-step comparison of Dynapakt low-water ratio methods, as opposed to wet mixes is included.

Centrifugal Pump. Kenco, Inc., 1125 N. Ridge Rd., Lorain, Ohio—This specification sheet describes the new Model P-104 all-purpose centrifugal pump, giving pump capacity, design features, specifications and dimensions.

Pipeline Strainers. The V. D. Anderson Co., Steam Specialties Div., 1935 W. 96th St., Cleveland 2, Ohio—This new 4-page bulletin, 252, describes the complete line of Anderson self-cleaning pipeline strainers. A discussion titled "Value of Sediment Control" points out the numerous pieces of pipe line equipment needing strainer protection. Complete specifications and prices are included.

Electric Fork Trucks. Lewis-Shepard Products, Inc., Dept. R 1, Watertown, Mass.—A comprehensive survey of the L-S electric fork truck line is contained in this 20-page catalogue. Designed with a handy file-away tab on its cover, this catalogue describes seven of the Spacemaster models, giving operating characteristics, latest engineering developments, maintenance features and all accessories and attachments.

Converting Equipment. Dilts Machine Works, Fulton, N. Y.—Various machines and attachments in the Dilts line of converting equipment are illustrated and briefly described in the 4-page bulletin 10-DM.

Dust Collectors. Pangborn Corp., Hagerstown, Md.—This 8-page bulletin No. 914 describes Pangborn's new cloth-bag dust collector. Illustrated by 12 photos, seven line drawings, and two elevation drawings, the bulletin tells how the cloth-bag collectors work and how they are installed and maintained. It also gives specifications of standard collector sizes and dimensions.

Tractor Tools. Hyster Co., 2902 N. E. Clackamas St., Portland 8, Ore.—A pictorial and verbal description of the complete line of Hyster tractor tools is contained in this 6-page catalogue, No. 1191. The catalogue also graphically shows practical applications of the equipment to multiply tractor uses and increase tractor production.

Dust Collectors. American Wheelabrator & Equipment Corp., 1241 S. Byrkit St., Mishawaka, Ind.—Bulletin No. 312 explains the application of Dustube cloth-tube-type collectors for paper dust in the bookbinding industry.

Protective Coatings. Prufcoat Laboratories, Inc., 50 E. 42nd St., New York 17, N. Y.—Bulletin No. 501 shows in chart form the resistance of various types of Prufcoat, synthetic resin protective coating, to some 69 chemicals (in both concentrated and dilute form).

Polymers and Copolymers. National Starch Products Inc., National Adhesives Div., 270 Madison Ave., New York 16, N. Y.—This 4-page folder on vinyl acetate polymers and copolymers in solution and emulsion form lists properties of five typical solutions and five typical emulsions. The folder also discusses compatibility of the solutions and emulsions with modifiers, the use of plasticizers, and potential applications of the resins.

Cationic Resins. Hercules Powder Co., Wilmington, Del.—Complete technical data about Kymene, a strongly cationic resin for wet-strength paper, is contained in this new technical 12-page booklet. Included are sections on the properties of Kymene, application factors, properties of wet-strength papers containing Kymene, and testing procedures.

Sizing. Monsanto Chemical Co., Paper Chemical Dept., Boston 49, Mass.—The use of blended, synthetic resin-rosin sizing in the paper industry is described in this new booklet. It contains data on advantages gained by application of this sizing, Mersize RM; its preparation; characteristics; improvements in operation, etc.

Precision Instruments. Associated Research, Inc., 3758 W. Belmont Ave., Chicago 18, Ill.—Designed to give quick information on all precision instruments manufactured by Associated Research, Bulletin 10A includes a photograph and short description of each model.

Rheostats and Resistors. Rex Rheostat Co., 3 Foxhurst Rd., P. O. Box 232, Baldwin, L. I., N. Y.—This 15-page catalogue, No. 5, shows a compete line of tubular rheostats, potentiometers, and resistors. It contains numerous drawings, diagrams, and tables.

Drives. Reliance Electric & Engineering Co., 1088 Ivanhoe Rd., Cleveland 10, Ohio.—Designated as Bulletin D-2311, this 8-page, illustrated booklet presents a simplified, non-technical explanation of the Reliance V-S Drive. Briefly discussed are seven basic functions of this method of power transmission. Application of this equipment to seven typical manufacturing operations in as many industries also is illustrated. Diagrammatic and tabular charts covering basic speeds and horsepower-torque characteristics of the drive are included.

Liquid Level Controls. B/W Controller Corp., 2200 E. Maple Rd., Birmingham, Mich.—This 36-page booklet describes floatless liquid level and industrial controls. Included are many photographs, tables, and dimension and application diagrams.

SALES REPRESENTATIVE

Prominent manufacturer of paper machine clothing has opening for sales representative.

We need a young man with initiative, moderate habits, good personality and appearance who must have considerable experience on paper machines.

Sales experience is desirable but not necessary.

Send detailed application with photo (which will not be returned) to Box 535, The Paper Industry.

WANTED:
BOARD-MAKING MACHINE

Australian company requires board-making machine in good condition, with or without Waste-paper Preparation Plant, for the manufacture of Chip-and-Filler Board; capacity 12-30 tons per 24 hours. Supplier of machine will be invited to invest value of machine in new company to be formed in Australia. Good return on capital assured; excellent references.

Write to

"BOARD" c/o H. FISCHER, PUBLIC ACCOUNTANT
50 Queen St. Melbourne C.1. Victoria, Australia

MEN WANTED—POSITIONS OPEN

We can place—Superintendent for rag content and fine papers; supt. multiwall sack plant; asst. supt. industrial relations; asst. supt. fourdrinier machine mill; asst. supt. paper converting, printing and packaging plant.

Chemists and chemical engineers for mills and for demonstrating and selling, also laboratory men; finishing foreman; color matcher; cylinder and fourdrinier machine foremen.

Superintendent of engineering, maintenance supt., designers and draftsmen; salesman and asst. sales mgr. for rag content and fine papers; beater engineers; master mechanics and plant engineers.

LIST YOUR CONFIDENTIAL APPLICATION WITH US
to keep informed of attractive positions
open in the pulp and paper mills.
CHARLES P. RAYMOND SERVICE, Inc.
294 Washington Street — Boston 8, Massachusetts
Specialists in placing and supplying pulp and paper executives

WANTED—Nationally-known Corporation wants qualified paper maker as shift foreman in roofing felt mill in York, Pa. Opportunity to take over Superintendency in short time. Please give complete qualifications in application. Address: Box 536, The Paper Industry.

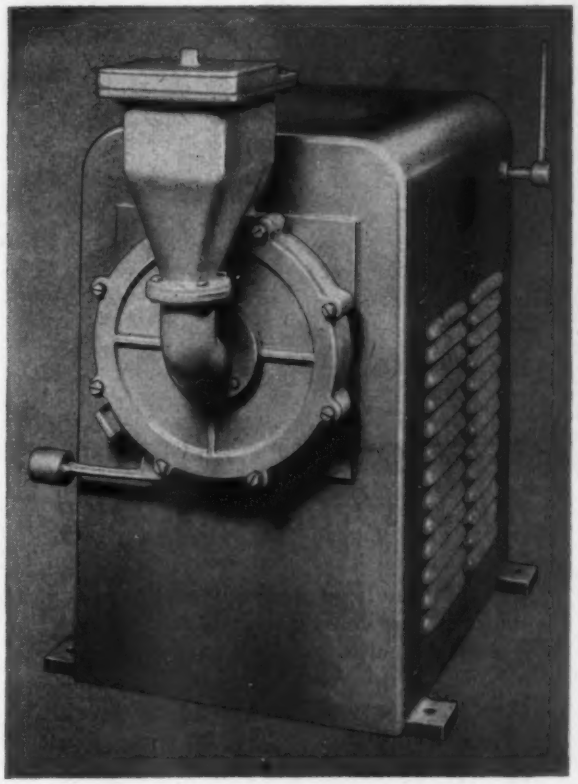
Nine Publications for Papermakers

Pulp and Paper, Volume I	$15.00
Modern Pulp and Paper Making	9.50
Procedure Handbook of Arc Welding	2.00
Outside U.S.A.	2.50
Drying of Paper on the Machine	1.50
Notes and Observation on Beaters	1.00
Lessons in Papermaking—Part 1	1.00
Lessons in Papermaking—Part 2	1.00
Trouble on the Paper Machine	.75
Pulp Bleaching (A Symposium)	.50
Technology of Papermaking Fibres	.50

Mail your order with payment to:

The PAPER INDUSTRY
431 S. Dearborn Street, Chicago 5, Illinois

BEATING CURVES
in 3 to 5 minutes



Bauer MEAD LAB. REFINER

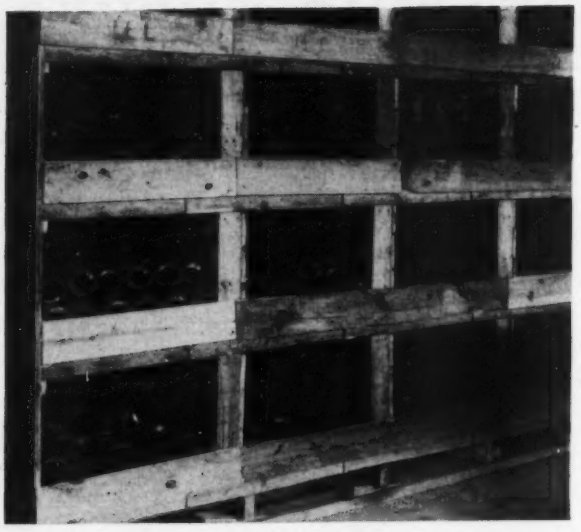
To save time while obtaining more accurate results, this machine was designed in the Central Research Laboratory of Mead Corporation. The manufacturing rights were assigned to us.

After 80 grams of bone dry pulp are mixed with water to 2% consistency, the sample is put into the Bauer-Mead Laboratory Refiner. The refining time is the interval between closing and opening the disks.

A strength curve on sulphite can be developed in a maximum interval of three minutes; on kraft, in up to five minutes.

You'll want to know all about this helpful and time-saving laboratory apparatus. *Ask for descriptive literature and data.*

THE BAUER BROS. CO.
1759 Sheridan Ave.
Springfield, Ohio



Tons of "K" Fittings *for hospital building*

Many of the fittings have already been installed. Many more are stored in other bins. The photograph shows only a few of the tons of "K" cast-iron fittings delivered by a distributor to the plumbing contractor for a hospital building under construction.

If you examine a "K" fitting, you'll see that it's an excellent piece of work. The walls are smooth inside and out. The threads are sharp and clean; the entrances chamfered. The angularity of each fitting is correct. In the case of a "K" flanged fitting, the faces are accurately milled; the bolt holes exactly spaced.

"K" fittings are structurally uniform, close-grained, and free of defects. In tensile strength they far exceed the standard requirement.

Order fittings from distributors who handle the Kuhns line bearing the "K" trade-mark.

CAST-IRON FITTINGS
3000 SHAPES AND SIZES

THE KUHNS BROTHERS COMPANY
Dayton 1, Ohio
Established 1887

MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

The following are OPS ceiling prices, cents per pound, delivered mills:

	per cwt.
Blue Overalls	14.50
Corduroy	8.00
Washables, No. 1	6.50
Percales	12.50
Light Prints, No. 1	11.50
Khaki Cuttings—	
Sun Tan	11.50
Mixed	8.00
New White Canvas	19.00
Canton Flannels, bleached	21.00
Canton Flannels, unbleached	21.00
Shirt Cuttings—	
New White No. 1	21.00
Silesias No. 1	16.00
New Unbleached	21.00
Fancy	10.00
Linen Cuttings—	
American	14.50
White	21.00
Grey	21.00

Current quotations to mills, f.o.b. New York:

Blue Overalls	13.00-13.50
Washables, No. 1	5.25- 5.50
Light prints, No. 1	9.00- 9.50
Khaki Cuttings, Mixed	6.00- 6.25
Canton Flannels, Bleached	16.50-17.00
Canton Flannels, Unbleached	16.50-17.00
White Shirt Cuttings, No. 1	17.00-18.00
Silesias, No. 1	12.50-13.00
New Unbleached Muslins	18.00-19.00
Fancy Shirt Cuttings	8.50- 9.00
American Linen Cuttings	12.00-13.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing—	
No. 1	1.30 to 1.40
No. 2	.95 to 1.05
No. 3 and 4	.80 to .90
Twos and Blues—	
Repacked	3.00 to 3.25
Thirds and Blues—	
Repacked	2.50 to 2.75
Miscellaneous	2.00 to 2.25
Whites, No. 1—	
Repacked	6.00 to 6.25
Miscellaneous	5.00 to 5.25
White, No. 2—	
Repacked	4.75 to 5.00
Miscellaneous	4.00 to 4.25

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	5.50 to 5.75
Domestic	6.00 to 6.25
Wool Tares—	
Light	7.00 to 7.50
Heavy	7.50 to 8.00
No. 1 Scrap Bagging	5.00 to 5.25
Manila Rope—	
No. 1 large	9.00 to 9.50
No. 1 small	8.00 to 8.25
Sisal Rope—	
No. 1 large	7.50 to 8.00
No. 1 small	7.00 to 7.25
New Burlap Cuttings	7.00 to 7.50
Jute Threads—	
Foreign (Nom.)	8.00 to 8.50
Domestic	8.00 to 8.50
Strings—	
No. 1 sisal	6.00 to 6.50
No. 2 sisal	5.50 to 5.75
Soft jute	5.75 to 6.00
Mixed	4.00 to 4.25

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts	130.00 to 135.00
Hard White, No. 1	90.00 to 95.00
Soft White, one-cut	75.00 to 80.00
Soft White, No. 1	65.00 to 70.00
Soft White, Misc.	50.00 to 55.00
Fly Leaf, No. 1	35.00 to 40.00
Fly Leaf, Woody No. 1	25.00 to 30.00
No. 2 Mixed Col. Woody	20.00 to 25.00
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	30.00 to 32.00
Mixed Books	20.00 to 21.00
Ledger Stock—	
No. 1 White	50.00 to 55.00
No. 1 Mixed (Colored)	30.00 to 35.00
Manilas—	
New Env. Cuttings	70.00 to 75.00
New Env. Cuts, One-Cut	—
Extra Manilas	30.00 to 35.00
Manila Tab Cards, Free of Ground Wood	70.00 to 75.00
Colored Tab Cards	50.00 to 55.00
Kraft—	
New Envelope Cuttings	60.00 to 65.00
Tripled Sorted No. 1 100%	40.00 to 42.50
No. 1 Old Assorted	27.50 to 30.00
News—	
White Blank	60.00 to 65.00
Overissue	16.00—
No. 1 Folded	8.00—
Old Corrugated Containers	11.00—
New Jute Corrugated Cuts	16.00—
Mill Wrappers	8.00—
Box Board Chips	6.00—
No. 1 Mixed Paper	5.00—

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.55—
Ground, cwt.	4.30—
Powdered, cwt.	4.70—
Blanc Fixe—	
Pulp, bulk, ton	90.00—
Dry, barrels	95.00—
Bleaching Powder—	
Drums, cwt.	5.00 to 6.00
Casein (Domestic Standard)	
20-30 mesh (bags), lb.	
80-100 mesh (bags), lb.	27.50—
Argentine, lb.	16.00—
China Clay—	
Domestic Filler Bulk (mine) ton	10.00 to 15.00
Domestic Coating Bulk (mine) ton	15.00 to 25.00
Imported (ship side) Bulk (lump) ton	22.00 to 30.00

MARKET QUOTATIONS

Chlorine—		
Tanks cars (wks) cwt.	2.70—	
Gelatine (silicin), lb.	**1.25 to**	**1.35**
Glyc. (C.P.) drums, lb.	54.25 to	54.75
Litharge, powd. bbl. lb.	.1675 to	.1775
Rosin (Gum)—	**New York, per 100 lbs.**	
E	8.35—	
F	8.35—	
G	8.35—	
WW	8.50—	
Rosin (Wood), carlots,		
F.O.B. South	4.50 to	4.75
Salt Cake—		
Dom. bulk (wks) ton	17.00 to	23.00
Imp. bulks on dock—		
(Atl. ports) ton (Nom.)	**25.00—**	
Soda Ash—		
Bulk (works) cwt.	**1.20—**	
Paper bags, cwt.	1.50—	
Soda (Caustic)—		
Solid drums, cwt.	3.35 to	3.40
Ground and flake, drums, cwt.	**3.75 to**	**3.85**
Sodium Silicate—		
60 deg. 55 gal. drums, (works) cwt.	1.70 to	1.80
40 deg. 35 gal. drums, (works), cwt.	1.40 to	1.50
Starch—		
Pearl, 140 lb. bags, cwt.	6.44—	
Pearl, barrels, cwt.	6.44—	
Paper (Sp.) bags, cwt.	6.44—	
Powdered, barrels, cwt.	6.65—	
Sulphur (Crude)		
(Mine) bulk, long ton	21.00 to	22.00
Talc—		
Dom. 100 lb. bags (mine) ton	25.00 to	28.00
Canadian	35.00 to	45.00
Titanium Dioxide—		
Barium Pig, bbls., lb.	.21 to	.21½
Calcium Pig, bbls., lb.	.21 to	.21½
Zinc Sulphide, bbls., lb.	11.50 to	11.75

WOOD PULP

The following are OPS ceiling prices on domestic wood pulp, dollars per short air dry ton delivered consuming mills including the basic maximum freight allowances as provided:

Bleached sulphite	140.00—
Unbleached sulphite	132.50—
Bleached sulphate	145.00—
Semi-bleached sulphate	140.00—
Unbleached sulphate	132.50
Bleached soda	140.00—
Ground wood	92.50—
Sulphite screenings	72.50—
Sulphate screenings	67.50—
Ground wood screenings	60.00—
Unbleached sulphate siderun	132.50—
Standard news print siderun	92.50—

OPS ceiling prices on European wood pulp, dollars per short air dry ton, on dock at American Atlantic ports, follow:

Bleached sulphite	225.00—
Bleached sulphate	230.00—
Unbleached sulphite	200.00—
Unbleached sulphate	200.00—

Current quotations on imported wood pulp, dollars per short air dry ton, on dock American Atlantic ports follow:

Bleached sulphite	172.50-182.50
Bleached sulphate	180.00-185.00
Unbleached sulphite	155.00-160.00
Unbleached sulphate	145.00-150.00

PAPER

Boards—

OPS ceiling prices (CPR 108) per ton, delivered consumer's mill, 10 tons or more:

Plain chip	105.00—
News vat lined chip	107.50—
Filled news	110.00—
Solid news	112.50—
White vat lined chip	142.50—
Chip tube and can stock	110.00—
Single manilla lined chip	147.50—
Single jute lined chip	145.00—
White patent coated:	
.020	175.00—
.018	177.50—
.016	180.00—

Book Paper—

OPS ceiling prices (CPR 106) per cwt.:

Coated two sides	
70 lb. No. 2 enamel, 25x38-500, trimmed 4 sides	4 cases $17.25 Carloads $16.30
45 lb. enamel, 25x38-500, trimmed 4 sides	4 cases $13.05 Carloads $12.10
Uncoated	
55 lb. No. 2 offset, 25x38-500, trimmed 4 sides	4 cases $14.80 Carloads $13.85
50 lb. A Grade English Finish, 25x38-500, untrimmed	4 cases $14.05 Carloads $13.10
20 lb. envelope, 17x22-500, untrimmed	Carloads $12.4
16 lb. tablet, 17x22-500	Carloads $11.3

Rag Content Bond—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

	17 lbs. or heavier	16 lbs.
Extra 100% rag	57.50	58.50
100% rag	49.50	50.50
75% rag	38.00	39.00
50% rag	29.50	30.50
25% rag	24.00	25.00

Rag Content Ledger—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

Extra 100% rag	58.50
100% rag	50.50
85% rag	42.00
75% rag	39.50
50% rag	30.50
25% rag	25.00

Sulphite Bond—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

	17 lbs. or heavier	16 lbs.
Air dry bond (Watermarked)	20.00	21.00
No. 1 bond (M.F. watermarked)	15.50	16.20
No. 2 bond (M.F. watermarked)	14.90	15.60
Plain bond (M.F. unwatermarked)	14.00	14.60

Sulphite Ledger—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

No. 1, M.F. watermarked	16.50
No. 2, M.F. watermarked	15.90
Plain, M.F. unwatermarked	15.00

Glassine (f.o.b. mill)—

OPS base ceilings (CPR 76):	**per cwt.**
25 lb. base No. 1 bleached glassine	**22.50—**
25 lb. base No. 1 bleached greaseproof	**20.00—**

News—

	per ton
Rolls, Standard (Contract)	116.00—
Rolls (Spot)	**(Nominal)**
Sheets	130.00—

Tissues (Carlots)—

	per ream
White No. 1	1.90—
White No. 2	1.60—
Bleached Anti-Tarnish	**—**
Colored	**2.00—**
Anti-Tarnish Kraft	1.90—
Manila	**2.00—**
Napkins, semi-crepe (12¾ lb. to M shts.) per cs.	**.90—**
Napkins, full crepe and embossed (12¾ lb. to M shts.) per cs.	**.90—**
Toilet, Bleached (M shts.) per cs.	10.00—
Toilet, Unbleached (M shts.) per cs.	8.00—

Towels

	per case
Bleached	6.80—
Unbleached	5.90—

Wrappings (Kraft)—

OPS ceilings, per cwt., 50 lb. base weight:	**per cwt.**
Standard wrapping	**7.75—**
Butchers, counter rolls	**8.25—**
Standard bag, mill rolls	**7.50—**
Shipping sack, mill rolls	**7.75—**
Gumming, mill rolls	**8.00—**
Asphalting, mill rolls	**7.75—**
Envelope, mill rolls	**9.25—**

RAINY RIVER WATERS COME CLEAR

— for Minnesota and Ontario Paper

Rainy River water has color ranging from 40 to 80 ppm, making it unusable for bleached pulp and paper. The Minnesota & Ontario Paper Company successfully reduces color to a range from 2 to 4 ppm through use of two horizontal Permutit® Precipitators and five gravity filters. The cost for chemicals averages less than 1.5¢ per 1,000 gallons. The purity, low color and lack of turbidity make the effluent water ideal for production of high brightness pulps and papers.

Here is yet another case where Permutit know-how and equipment have helped produce finer pulps and papers, regardless of the original state of the water supply. For full information, write to The Permutit Company, Dept. PI-6, 330 West 42nd St., N. Y. 36, N. Y. or to Permutit Company of Canada, Ltd., 6975 Jeanne Mance St., Montreal.

PERMUTIT *CONTROLLED* PROCESS WATER MEANS:

- Clean, high quality paper products.
- Higher production—lower production costs.
- More sales . . . bigger profits.

PERMUTIT

WATER CONDITIONING HEADQUARTERS FOR 40 YEARS

PUT *ACTION* IN YOUR SAFETY PROGRAM

Add a touch of showmanship to your safety program. Films let you tell your training story with the dramatic impact of pictures . . . action . . . sound. You can cut your safety training in half, give fewer refresher courses and get better results by using training films.

Here are three film sets that will help you arouse and keep alive interest in your safety program. And there is no better way to teach foremen how to be better supervisors.

SPEAKING OF SAFETY

A brand new set of films that will teach your foremen and supervisors the tips they should know about making safety talks, and how to transmit management's ideas and plans. Six 35mm sound slidefilms and leader's manual in an attractive leatherette case.

HUMAN FACTORS IN SAFETY

This is a series of six 35mm sound slidefilms with leader's manual that may be used for an advanced safety course. Each film deals with one aspect of the complex art of handling people. Collectively, the films show how to train workers, how to keep experienced people on their toes and how to win respect, cooperation and loyal support.

SAFETY MANAGEMENT FOR FOREMEN

A set of ten 35mm sound slidefilms—all that is needed for a course in safety fundamentals. The films explain how to organize a safety program, what part the foreman plays in the program and how safety increases production. They also discuss specific safety activities, such as machine guarding, safety inspections, the first aid program, etc. Complete with leader's manual in an attractive leatherette case.

Write for complete information and details to the

NATIONAL SAFETY COUNCIL

425 North Michigan Ave., Chicago 11, Illinois

The Paper Industry Index to Advertisers

When writing them, please mention The PAPER INDUSTRY.

Refer to the Paper and Pulp Mill Catalogue and Engineering Handbook at your mill office, for complete listing of all advertisers' products.

Advertising Council, Inc.
American Car & Foundry Co. 317
American Defibrator, Inc.
American Hoist and Derrick Co. 347
American Lumber & Treating Co.
American-Marietta Company
Anheuser-Busch, Inc.
Anthracite Equipment Corporation 394
Appleton Machine Co., The 312, 313
Appleton Wire Works, Inc. 290
Appleton Woolen Mills 337
Armstrong Machine Works
Asten-Hill Mfg. Co.
Atkins and Company, E. C. 386
Aurora Pump Company

Babcock & Wilcox Co., Tubular Products Division
Bagley & Sewall Co., The 318
Bailey Meter Company
Barco Manufacturing Co.
Barrell Co., William L. 1st Cover
Bauer Bros. Co., The 405
Becco Sales Corporation 303
Beckman Instruments, Inc.
Beloit Iron Works
Bird Machine Company 311
Black-Clawson Co., The 298
Bowser, Inc.
Bowsher Co., The N. P. 398
Buffalo Forge Company 374
Buffalo Pumps, Incorporated

Cameron Machine Co.
Carthage Machine Co.
Chain Belt Company 300
Chicago Bridge & Iron Company 284
Chicago Electric Company 394
Classified Advertising 405
Corn Products Sales Co. 397
Counter & Control Corp.
Crane Packing Co.
Curlator Corporation 296

DeZurik Shower Company
Diamond Power Specialty Corp.
Dicalite Div., Great Lakes Carbon Corp.
Dilts Machine Works 298
Downingtown Mfg. Co.
Draper Brothers Company
du Pont de Nemours & Co., E. I. 315

Eastwood-Nealley Corporation 399
Electric Eye Equipment Co.
Electric Machinery Mfg. Co.
Elliott Company 293
English China Clays Sales Corp. 403
Eriez Manufacturing Co.

Fabri-Valve Co. of America 393
Farquhar Company, A.B. 391
Fawick Airflex Company, Inc. 328
Fisher Governor Co.
Fitchburg Screen Plate Co., Inc. 395
Foxboro Company, The 286
Fritz Publications, Inc. 405, 409
Fulton Iron Works Company

Garlock Packing Co., The
General American Trans. Corp.
General Chemical Division, Allied Chemical & Dye Corporation 297
Gilbert & Nash Company
Goulds Pumps, Inc. 314
Graton & Knight Co.
Graver Tank & Mfg. Co., Inc.
Gruendler Crusher & Pulverizer Co.

Hanchett Manufacturing Co. 397
Harrington & King Perforating Co. 391
Hercules Powder Company 308
Hooper & Sons Co., Wm. E. 373
Hubinger Company, The 382
Hudson-Sharp Machine Company 382
Huyck & Sons, F. C.

Improved Paper Machy. Corp. 285
International Harvester Co. 306
Interscience Publishers, Inc.

Jackson & Church Company
Jeffrey Mfg. Co., The
Jenkins Bros. 301
Jenssen Company, G. D. 403
Johnson Corporation, The
Jones & Sons Company, E. D. 339

Kalamazoo Tank & Silo Co.
Kelco Company 340
Kil-Jet Distributing Co.
Kuhns Brothers Company, The 406

Langston Co., Samuel M.
Layne & Bowler, Inc. 395
Leeds & Northrup Company
Lindsay Wire Weaving Co., The 393
Link-Belt Company 294, 331
Link-Belt Speeder Corporation
Lockport Felt Company
Lodding Engineering Corp.
Lunkenheimer Co., The 4th Cover

Magnus Metal Corporation 403
Manchester Machine Company, The 334
Mason-Neilan Regulator Co. 282-283
Michigan Pipe Company
Michigan Steel Casting Co. 398
Midvale Company, The 349
Midwest-Fulton Machine Co., The 391
Midwest Piping & Supply Co., Inc.
Milton Roy Company
Modern Engraving & Machine Co.
Moore & White Co.
Morden Machines Company
Morningstar, Nicol, Inc.
Mt. Vernon-Woodberry Mills, Inc. 299
Murray Mfg. Co., D. J.

Nash Engineering Co., The 377
National Aluminate Corp. 280
National Safety Council 408
Naylor Pipe Company

(Continued on facing page)

Nichols Engr. & Research Corp.....
Noble & Wood Machine Co.....3rd Cover
Norton Company.....
Nugent & Company, Inc., Wm. W.....

OCO Water Systems, Inc.....
Ohio Injector Co., The.....
Oldbury Electro-Chemical Co.....
Oliver United Filters, Inc.....368-369
Orr Felt & Blanket Co., The.....

Paisley Products, Inc.....
Palmer Filter Equipment Company.... 394
Pandia Inc.....
Paper and Pulp Mill Catalogue..... 409
Paper Industry, The..... 405
Peerless Pump Div., F.M.C.....
Pennsylvania Flexible Metallic Tubing Co.....
Perfecting Service Co.....2nd Cover
Perkins & Son, Inc., B. F.....
Permutit Company, The..... 407
Photovolt Corporation..... 386
Poole Foundry & Machine Co..... 386
Powell Company, The Wm..... 287
Pusey & Jones Corp., The..... 323

Raymond Service, Inc., Chas. P..... 405
Read Standard Corporation..... 389
Rice Barton Corporation.....
Rice Barton Research Corp..... 327
Rogers & Co., Samuel C.....
Roots-Connersville Blower Div..... 401
Ross Engineering Corp., J. O.....
Ross Heater & Mfg. Co., Inc.....
R-S Products Corporation..... 292

Sandy Hill Iron & Brass Works....344-345
Sarco Company, Inc..... 395
Shartle Bros. Machine Co..... 298
Shuler & Benninghofen..... 304
Solvay Sales Division, Allied Chemical & Dye Corporation.....
Staley Mfg. Co., A. E.....
Standard Oil Co. (Indiana)..... 288
Stephens-Adamson Mfg. Co..... 316
Stickle Steam Specialties Co..... 385
Sutherland, Inc..... 295
Sutherland Refiner Corp..... 279
Swenson Evaporator Company..... 310

Testing Machines, Inc.....
Texas Gulf Sulphur Co.....
Timken Roller Bearing Co..... 291
Titanium Pigment Corporation.....
Tri-Clover Machine Co..... 289
Tropical Paint & Oil Co..... 324
Turney Halsey Company..... 299

U.S.A.—Treasury Dept..... 410

Valley Iron Works Company.....
Vanderbilt Co., Inc., R. T.....

Waterbury & Sons Co., H..... 393
Waterbury Felt Co., The..... 403
Western Precipitation Corp.....
Weyerhaeuser Timber Co..... 305
Whiting Corporation..... 310
Williams-Gray Company.....
Wisconsin Wire Works..... 398
Worthington Corporation..... 302
Wyandotte Chemicals Corporation.... 381

Yarnall-Waring Company.....
Youngstown Welding & Engineering Co., The..... 385

Professional & Business Services Section

Dreshfield, Arthur C..... 404
Sirrine Company, J. E..... 404

Looking for Something?

★ **machinery?** ★ **equipment?**

★ **chemicals?** ★ **information?**

Look for it in

3 books in One!

1 THE BUYERS SERVICE SECTION . . . includes a complete, cross-indexed list of 150 of America's largest and most responsible manufacturers and Suppliers, and an exhaustive description of their products as they apply to the paper and pulp industry . . .

2 THE MANUFACTURERS CATALOGUE SECTION . . . contains pages, inserts and complete catalogues giving exact data on equipment available to the paper and pulp industry . . .

3 THE ENGINEERING HANDBOOK . . . is a comprehensive source of the vital facts of the industry, and quick information for the paper and pulp industry's executives and personnel—119 pages of engineering data, graphs, charts, tables, etc., etc.

IT'S IN YOUR MILL OFFICE—NOW!

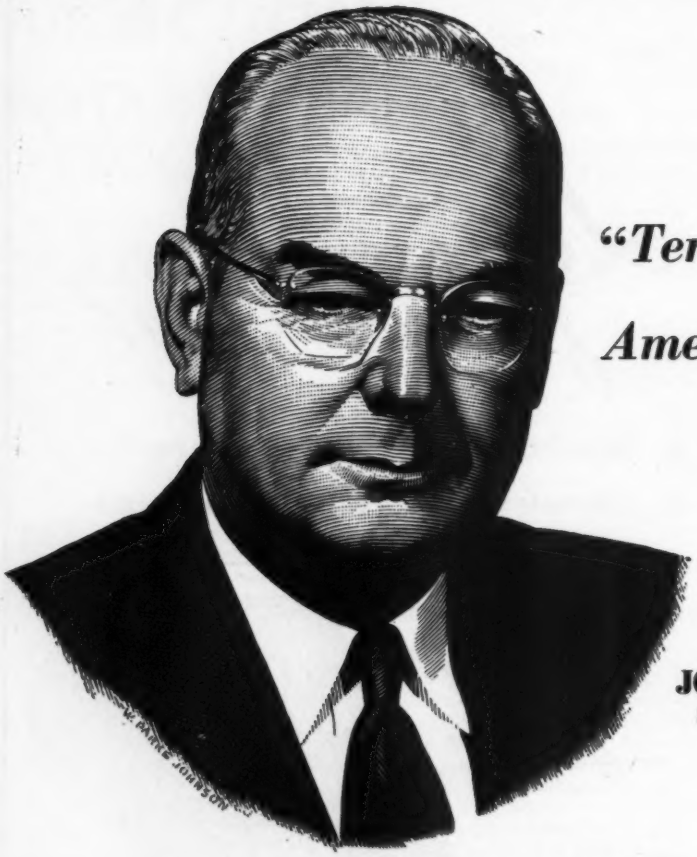
Refer to it whenever you are "looking for something." Make it available to EVERYBODY in your plant. Cooperate: write us your comments and suggestions for improving the new 1952-53 edition now in preparation.

"The Paper and Pulp Mill Catalogue" and "The Paper Industry" are published by

FRITZ PUBLICATIONS, INC.

431 SOUTH DEARBORN STREET . . . CHICAGO 5

Since 1919 — the Service Organization of the Paper and Pulp Industry



"Ten years ago America's Business publications . . ."

JOHN W. SNYDER
Secretary of the Treasury

"Ten years ago America's business publications, as a voluntary public service, presented for the first time advertisements outlining the Payroll Savings Plan for the regular purchase of U. S. Savings Bonds, and urged its acceptance. During the decade which has passed, American business has consistently supported the Payroll Savings Plan and made it a success. Continuation of this cooperation with the Treasury is most essential in the present emergency. Expanded sales of Defense Bonds will assist importantly in checking inflation, in preserving economic stability, and in furthering the over-all defense effort."

In ten brief years:

- From 700,000 in 1941 employee participation went to 27,000,000 at the peak of the war.
- Companies with Payroll Savings Plans jumped from 10,000 in 1941 to more than 175,000 during the war.
- Since January 1, 1951, the number of men and women on Payroll Savings has grown from 5,000,000 to 6,200,000.
- On September 30, 1951, individuals held Series E Bonds totaling $34.6 Billion—more than $4.6 Billion greater than on V-J Day.
- In the January-September, 1951, period, 33,418,000 $25 E Bonds were purchased—a gain of 17% over the same period of 1950. 8,966,000 $50 E Bonds were sold in the first nine months of 1951. *$25 and $50 denominations are the bonds bought by Payroll Savers.*

Congratulations to the executives of industry and the publishers of business papers for their continuing effort in promoting systematic savings through the Payroll Savings Plan—the plan that protects America and Americans.

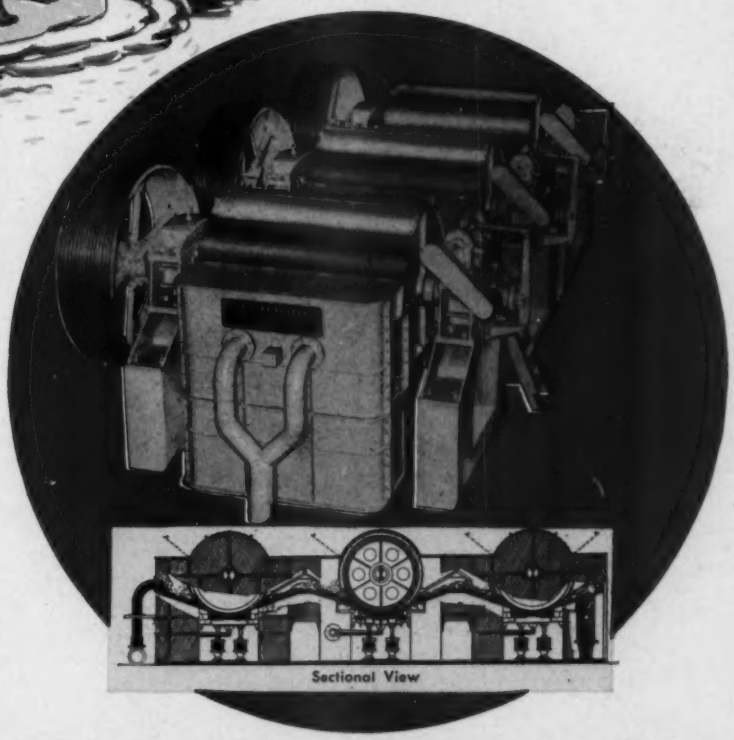
The U. S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

THE PAPER INDUSTRY

V
Si
50
m
pe

In
TC
to

lowest maintenance cost!



EXCLUSIVE FEATURES OF THE VICTORY BEATER

1. *Controlled Flow — uniform, positive fibrillation*
2. *Pressurized bedplates*
3. *Absolute control up to 40 tons bedplate pressures*
4. *Centralized bedplates assure 100% roll-bedplate contact*
5. *Highest effective inch cut potential*
6. *Horizontal roll oscillation makes bars self-honing*
7. *Lowest maintenance cost*
8. *Tailored-to-your-plant, low-cost installation*
9. *Spherical, anti-friction roller bearings*
10. *1000 gallons per minute capacity*
11. *Highest quality, high tonnage production*
12. *All-time record for continuous production!*

*VICTORY BEATERS are made in two styles: (a) **Single Roll** units for handling batches as small as 500 pounds. (b) **Multi-Roll** units with two, three or more rolls for treating 100, 150, 200 or more tons per day on a continuous production basis.*

Investigation of the versatile record-breaking VICTORY BEATER is a must! Write, wire or phone today for Booklet PI 652.

The low maintenance cost of the VICTORY BEATER* is due to its unique design, careful engineering and rugged construction.

For instance, the rolls are mounted on anti-friction roller bearings — the stock is fed to the rolls in a controlled, uniform volume — the hydraulic bedplates exert steady positive pressures against the rolls — the bedplate and roll bars are self-honing and may be replaced after long life without removing the roll from the beater.

These and other exclusive features that reduce wear and tear and increase efficiency, plus actual outstanding records of production, quality and volume, have set the VICTORY BEATER in a class by itself! *Patents issued and pending.

THE NOBLE & WOOD MACHINE CO.

Paper Mill Machinery

HOOSICK FALLS • NEW YORK • U.S.A.

Mid-West: Ronningen Engineering Sales • Vicksburg, Mich. West Coast: Dan E. Charles Agency • 706 Jones Bldg. • Seattle 1, Wash.

Stop Costly Shutdowns Due To Valve Stem Failure

"Stemalloy"*

Outlasts The Next Best Stem Material

3 TO 1

Fig. 73

Lunkenheimer "Stemalloy" Valve Stems, endurance tested under actual steam-pressure and service conditions, consistently outlasted the next best stem material 3 to 1. If you want to eliminate stem failure, insist on Lunkenheimer Valves. All Lunkenheimer Bronze Valves and Iron Body Bronze Mounted Valves have "Stemalloy" stems. Of the millions in service, *not one has ever been returned due to wear failure.*

WRITE FOR "Lunkenheimer Copper Base Alloys," a useful booklet on valve metals which will help you select the right valve for a given application. It is available from your distributor, or from The Lunkenheimer Company, Box 360S, Cincinnati 14, Ohio.

*Patented alloy

BRONZE • IRON • STEEL

LUNKENHEIMER

THE ONE *Great* NAME IN VALVES

L-652-7